MODELS | SJ 9241 SJ 9250

Service Manual

Full-Size Rough Terrain Series

Part No. 143905AD February 2014

SKYJACK™

This manual is based on Serial Numbers:

ANSI/CSA & AS

SJ 9250	50,000,513 TO 50,000,745

CE

SJ 9241	55,000,001 TO 55,000,032
SJ 9250	50,000,513 TO 50,000,745

Please refer to the website www.skyjack.com for older Serial Numbers.

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SERVICE AND MAINTENANCE

Table of Contents

Section 1 - Scheduled Maintenance
Table of Contents

Section 2 - Maintenance Tables
Table of Contents

Section 3 - Schematics
Table of Contents

Section 4 - Troubleshooting
Table of Contents

Section 5 - Procedures
Table of Contents

The Safety Alert Symbol identifies important safety messages on aerial platforms, safety signs in manuals or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

This Safety Alert Symbol means attention!

Become alert! Your safety is involved.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT

IMPORTANT indicates a procedure) essential for safe operation and which, if not followed, may result in a malfunction or damage to the aerial platform.

Section 1
SCHEDULE MAINTENANCE

Table of Contents

Operator's Responsibility for Maintenance

Aerial Platform Definition....7
Purpose of Equipment....7
Use of Equipment....7
Manuals....7
Operator....7
Service Policy and Warranty....7
Optional Accessories....7
Scope of this Manual....8
Operator Safety Reminders....9
Electrocution Hazard....9
Safety Precautions....10
Maintenance and Inspection Schedule....13
Owner's Annual Inspection Record....13
Replacement Parts....13
Maintenance and Service Safety Tips....13
Hydraulic System & Component Maintenance and Repair....14
Maintenance Hints....14

Service and Maintenance

About this Section....15
Service Bulletins....15
Maintenance and Inspection....15
Maintenance Instructions....15

Schedule Maintenance Inspections

1.1 Scheduled Maintenance Inspections....18
1.2 Function Tests....28

Tables

1.1 Owner's Annual Inspection Record....16
1.2 Maintenance and Inspection Checklist....17

SKYJACK is continuously improving and expanding product features on its equipment, therefore, specifications and dimensions are subject to change without notice.

Aerial Platform Definition
A mobile device that has an adjustable position platform supported from ground level by a structure.

Purpose of Equipment
The SKYJACK Rough Terrain's mid and full size aerial platforms are designed to transport and raise personnel, tools and materials to overhead work areas.

Use of Equipment
The aerial platform is a highly maneuverable, mobile work station. Lifting and driving must be on a flat, level, compacted surface. It can be driven over uneven terrain only when the platform is fully lowered.

Manuals
Operating
The operating manual is considered a fundamental part of the aerial platform. It is a very important way to communicate necessary safety information to users and operators. A complete and legible copy of this manual must be kept in the provided weather-resistant storage compartment on the aerial platform at all times.

Service & Maintenance
The purpose of this is to provide the customer with the servicing and maintenance procedures essential for the promotion of proper machine operation for its intended purpose.

All information in this manual should be read and understood before any attempt is made to service the machine. The updated copy of the manuals are found on the company's website: www.skyjack.com.

Operator
The operator must read and completely understand both this operating manual and the safety panel label located on the platform and all other warnings in this manual and on the aerial platform. Compare the labels on the aerial platform with the labels found within this manual. If any labels are damaged or missing, replace them immediately.

Service Policy and Warranty
SKYJACK warrants each new SJRT series work platform to be free of defective parts and workmanship for the first 24 months. Any defective part will be replaced or repaired by your local SKYJACK dealer at no charge for parts or labor. Contact the SKYJACK Service Department for warranty statement extensions or exclusions.

Optional Accessories
The SKYJACK aerial platform is designed to accept a variety of optional accessories. These are listed under "Standard and Optional Features" in Table 2.1 of the operating manual. Operating instructions for these options (if equipped) are located in section 2 of the operating manual.

For non-standard components or systems, contact the SKYJACK Service Department at

North America & Asia:
☎ : 800 275-9522
🖷 : 630 262-0006

Europe:
☎ : 44 1691-676-235
🖷 : 44 1691-676-239

Include the model and serial number for each applicable aerial platform.

Scope of this Manual

a. **This manual** applies to the ANSI/SIA, CSA and CE versions of the Mid Size and Full Size Rough Terrain aerial platform models listed on Table 2.1.

- Equipment identified with "ANSI" meets the ANSI SIA-A92.6-2006 standard.
- Equipment identified with "CSA" meets the CSA B354.2-01 standard.
- Equipment identified with "CE" meets the requirements for the European countries, i.e., Machinery Directive 98/37/EC and/or 89/392/EE, EMC Directive 89/336/EEC, Directive 2000/14/EC and the corresponding EN standards.

b. **CSA (Canada) and CE (Europe)**
Operators are required to conform to national, territorial/provincial and local health and safety regulations applicable to the operation of this aerial platform.

c. **ANSI/SIA (United States)**
Operators are required by the current ANSI/SIA A92.6 standards to read and understand their responsibilities in the manual of responsibilities before they use or operate this aerial platform.

WARNING

Failure to comply with your required responsibilities in the use and operation of the aerial platform could result in death or serious injury!

Operator Safety Reminders

A study conducted by St. Paul Travelers showed that most accidents are caused by the failure of the operator to follow simple and fundamental safety rules and precautions.

You, as a careful operator, are the best insurance against an accidenvt. Therefore, proper usage of this aerial platform is mandatory. The following pages of this manual should be read and understood completely before operating the aerial platform.

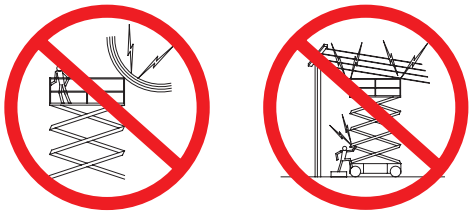
Common sense dictates the use of protective clothing when working on or near machinery. Use appropriate safety devices to protect your eyes, ears, hands, feet and body.

Any modifications from the original design are strictly forbidden without written permission from SKYJACK.

Electrocution Hazard

This aerial platform is not electrically insulated. Maintain a Minimum Safe Approach Distance (MSAD) from energized power lines and parts as listed below. The operator must allow for the platform to sway, rock or sag. This aerial platform does not provide protection from contact with or proximity to an electrically charged conductor.

DO NOT USE AERIAL PLATFORM AS A GROUND FOR WELDING.
DO NOT OPERATE AERIAL PLATFORM DURING LIGHTNING OR STORMS.



DANGER
Avoid Power Lines

Minimum Safe Approach Distance

ANSI/SIA A92.6-2006 and CSA B354.2-01 Requirements		CE Guidance Note "Avoidance of danger from overhead lines"
Voltage Range (Phase to Phase)	**Minimum Safe Approach Distance (Feet)**	**Adhere strictly to the governmental rulings and regulations applicable in your country.**
0 to 300V	Avoid Contact	
Over 300V to 50KV	10	
Over 50KV to 200KV	15	
Over 200KV to 350KV	20	
Over 350KV to 500KV	25	
Over 500KV to 750KV	35	
Over 750KV to 1000KV	45	

FAILURE TO AVOID THIS HAZARD WILL RESULT IN DEATH OR SERIOUS INJURY!

60023AD

Safety Precautions

Know and understand the safety precautions before going on to next section.

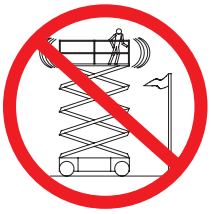
WARNING

Failure to heed the following safety precautions could result in tip over, falling, crushing, or other hazards leading to death or serious injury.

- **KNOW** all national, state/provincial and local rules which apply to your aerial platform and jobsite.
- **TURN** the (emergency) main power disconnect switch off when leaving the aerial platform unattended. Remove the key to prevent unauthorized use of the aerial platform.
- **WEAR** all the protective clothing and personal safety devices issued to you or called for by job conditions.
- **DO NOT** wear loose clothing, dangling neckties, scarves, rings, wristwatches or other jewelry while operating this aerial platform.

- **AVOID** entanglement with ropes, cords or hoses.

- **AVOID** falling. Stay within the boundaries of the guardrails.
- **DO NOT** raise the aerial platform in windy or gusty conditions.

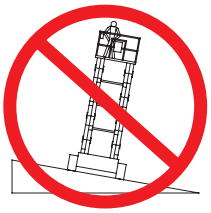


- **DO NOT** increase the lateral surface area of the platform. Increasing the area exposed to the wind will decrease aerial platform stability.

- **DO NOT** drive or elevate the aerial platform if it is not on a firm level surface. Do not drive elevated near depressions or holes of any type, loading docks, debris, drop-offs and surfaces that may affect the stability of the aerial platform.

- **If operation in areas with holes or drop-offs is absolutely necessary**, elevated driving shall not be allowed. Position the aerial platform horizontally only with the platform fully lowered. After ensuring that all 4 wheels or outriggers (if equipped) have contact with level firm surface, the aerial platform can be elevated. After elevation, the drive function must not be activated.

- **Elevated driving** must only be done on a firm level surface.



- **DO NOT** ascend or descend a grade when elevated. When fully lowered, ascending or descending, only grades up to rated maximum listed in Table 2.1 are permissible.

- **DO NOT** operate on surfaces not capable of holding the weight of the aerial platform including the rated load, e.g. covers, drains, and trenches.

Safety Precautions (Continued)

Know and understand the safety precautions before going on to next section.

- **DO NOT** operate an aerial platform that has ladders, scaffolding or other devices mounted on it to increase its size or work height. It is prohibited.

- **DO NOT** exert side forces on aerial platform while elevated.

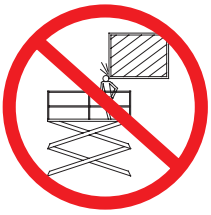
- **DO NOT** use the aerial platform as a crane. It is prohibited.

- **DO NOT** sit, stand or climb on the guardrails. It is prohibited.

- **DO NOT** climb on scissor arm assembly. It is prohibited.

- **BE AWARE** of overhead obstructions or other possible hazards around the aerial platform when driving or lifting.

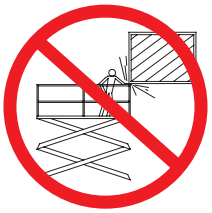
- **DO NOT** raise the platform while the aerial platform is on a truck, fork lift or other device or vehicle.

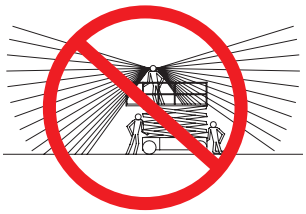


- **BE AWARE** of crushing hazards. Keep all body parts inside platform guardrail.

- **DO NOT** lower the platform unless the area below is clear of personnel and obstructions.

- **ENSURE** that there are no personnel or obstructions in the path of travel, including blind spots.





- **BE AWARE** of blind spots when operating the aerial platform.

- **STUNT** driving and horseplay are prohibited.

- **ENSURE ALL** tires are in good condition and lug nuts are properly tightened.

- **DO NOT** alter or disable limit switches or other safety devices.

- **DO NOT** use the aerial platform without guardrails, locking pins and the entry gate/chain/bar in place.

Safety Precautions (Continued)

Know and understand the safety precautions before going on to next section.

- **DO NOT** exceed the rated capacity of the aerial platform. Do make sure the load is evenly distributed on the platform.
- **DO NOT** attempt to free a snagged platform with lower controls until personnel are removed from the platform.
- **DO NOT** position the aerial platform against another object to steady the platform.
- **DO NOT** place materials on the guardrails or materials that exceed the confines of the guardrails unless approved by Skyjack.

Fall Protection

As per the ANSI A92.6-2006 standard, "The guardrail system of the aerial platform provides fall protection. If occupant(s) of the platform are required to wear personal fall protection equipment (PFPE), occupants shall comply with instructions provided by the aerial platform manufacturer (remanufacturer) regarding anchorage(s)."

If additional fall protection is required, by an employer or the authority having jurisdiction, Skyjack recommends the use of a fall restraint system to keep an occupant within the confines of the platform, and thus not expose the occupant to any fall hazard requiring a fall arrest.

All personal fall protection equipment must comply with applicable governmental regulations and must be inspected and used in accordance with the manufacturer's recommendations.

All personal fall protection equipment must be attached only to approved anchorage points within the platform of the aerial platform.

WARNING

Entering and exiting the aerial platform should only be done using the three points of contact.

- Use only equipped access openings.
- Enter and exit only when the aerial platform is in the fully retracted position.

- Do use three points of contact to enter and exit the platform. Enter and exit the platform from the ground only. Face the aerial platform when entering or exiting the platform.
- Three points of contact means that two hands and one foot or one hand and two feet are in contact with the aerial platform or the ground at all times during entering and exiting.

WARNING

An operator should not use any aerial platform that:

- does not appear to be working properly.
- has been damaged or appears to have worn or missing parts.
- has alterations or modifications not approved by the manufacturer.
- has safety devices which have been altered or disabled.
- has been tagged or blocked out for non-use or repair.

Failure to avoid these hazards could result in death or serious injury.

Jobsite Inspection

- Do not use in hazardous locations.
- Perform a thorough jobsite inspection prior to operating the aerial platform, to identify potential hazards in your work area.
- Be aware of moving equipment in the area. Take appropriate actions to avoid collision.

Maintenance and Inspection Schedule

The actual operating environment of the work platform governs the use of the maintenance schedule. The inspection points covered in Table 1.2. Maintenance and Inspection Checklist, indicates the areas of the aerial platform to be maintained or inspected and at what intervals the maintenance and inspections are to be performed.

Owner's Annual Inspection Record

It is the responsibility of the owner to arrange quarterly and annual inspections of the aerial platform. Table 1.1. Owner's Annual Inspection Record is to be used for recording the date of the inspection, owner's name, and the person responsible for the inspection of the work platform.

Replacement Parts

Use only original replacement parts. Parts such as batteries, wheels, railings, etc. with weight and dimensions different from original parts will affect stability of the aerial platform and must not be used without manufacturer's consent.

All replacement tires must be of the same size and load rating as originally supplied tires; to maintain safety and stability of aerial platform.

Consult SKYJACK's Service Department for optional tires specifications and installation.

WARNING

Any unit that is damaged or not operating properly must be immediately tagged and removed from service until proper repairs are completed.

Maintenance and Service Safety Tips

Maintenance and repair should only be performed by personnel who are trained and qualified to service this aerial platform.

All maintenance and service procedures should be performed in a well lighted and well ventilated area.

Anyone operating or servicing this aerial platform must read and completely understand all operating instructions and safety hazards in this manual and operating manual.

All tools, supports and lifting equipment to be used must be of proper rated load and in good working order before any service work begins. Work area should be kept clean and free of debris to avoid contaminating components while servicing.

All service personnel must be familiar with employer and governmental regulations that apply to servicing this type of equipment.

Keep sparks and flames away from all flammable or combustible materials.

Properly dispose of all waste material such as lubricants, rags, and old parts according to the relative law provisions obtaining in the country.

Before attempting any repair work, turn Battery Disconnect Switch to the "OFF" position.

Preventive maintenance is the easiest and least expensive type of maintenance.

Hydraulic System & Component Maintenance and Repair

The following points should be kept in mind when working on the hydraulic system or any component:

1. Any structure has limits of strength and durability. To prevent failure of structural parts of hydraulic components, relief valves which limit pressure to safe operating values are included in the hydraulic circuits.

2. Tolerance of working parts in the hydraulic system is very close. Even small amounts of dirt or foreign materials in the system can cause wear or damage to components, as well as general faulty operation of the hydraulic system. Every precaution must be taken to assure absolute cleanliness of the hydraulic oil.

3. Whenever there is a hydraulic system failure which gives reason to believe that there are metal particles or foreign materials in the system, drain and flush the entire system and replace the filter cartridges. A complete change of oil must be made under these circumstances.

4. Whenever the hydraulic system is drained, check the magnets in the hydraulic reservoir for metal particles. If metal particles are present, flush the entire system and add a new change of oil. The presence of metal particles also may indicate the possibility of imminent component failure. A very small amount of fine particles is normal.

5. All containers and funnels used in handling hydraulic oil must be absolutely clean. Use a funnel when necessary for filling the hydraulic oil reservoir, and fill the reservoir only through the filter opening. The use of cloth to strain the oil should be avoided to prevent lint from getting into the system.

6. When removing any hydraulic component, be sure to cap and tag all hydraulic lines involved. Also, plug the ports of the removed components.

NOTE

Samples of hydraulic oil should be drawn from the reservoir and tested annually. These samples should be taken when the oil is warmed through normal operation of the system. The sample should be analyzed by a qualified lubrication specialist to determine if it is suitable for continued use.

Oil change intervals will depend on the care used in keeping the oil clean, and the operating conditions. Dirt and/or moisture cotamination will dictate that the oil should be changed more often. Under normal use and operating conditions, the hydraulic oil should be changed every two years. Refer to Table 1.2 of this manual.

7. All hydraulic components must be disassembled in spotlessly clean surroundings. During disassembly, pay particular attention to the identification of parts to assure proper reassembly. Clean all metal parts in a clean mineral oil solvent. Be sure to thoroughly clean all internal passages. After the parts have been dried thoroughly, lay them on a clean, lint-free surface for inspection.

8. Replace all O-rings and seals when overhauling any component. Lubricate all parts with clean hydraulic oil before reassembly. Use small amounts of petroleum jelly to hold O-rings in place during assembly.

9. Be sure to replace any lost hydraulic oil when completing the installation of the repaired component, and bleed any air from the system when required.

10. All hydraulic connections must be kept tight. A loose connection in a pressure line will permit the oil to leak out or air to be drawn into the system. Air in the system can cause damage to the components and noisy or erratic system operation.

Maintenance Hints

Three simple maintenance procedures have the greatest effect on the hydraulic system performance, efficiency and life. Yet, the very simplicity of them may be the reason they are so often overlooked. What are they? Simply these:

1. Change filters annually. The filters will need to be changed more often depending on the operating conditions. Dirty, dusty, high moisture environments may cause the hydraulic system to be contaminated more quickly.
2. Maintain a sufficient quantity of clean hydraulic oil of the proper type and viscosity in the hydraulic reservoir.
3. Keep all connections tight.

About this Section

This section contains the maintenance and inspection schedule that is to be performed.

References are made to the procedures in section 5 that outline detailed step-by-step instructions for checks and replacements.

Service Bulletins

Before performing any scheduled maintenance inspection procedure, refer to service bulletins found in our web site: www.skyjack.com for updates related to service and maintenance of this aerial platform.

Maintenance and Inspection

Death or injury can result if the aerial platform is not kept in good working order. Inspection and maintenance should be performed by competent personnel who are trained and qualified on mantenance of this aerial platform.

WARNING

Failure to perform each procedure as presented and scheduled may cause death, serious injury or substantial damage.

NOTE

Preventive maintenance is the easiest and least expensive type of maintenance.

- Unless otherwise specified, perform each maintenance procedure with the aerial platform in the following configuration:
  - Aerial platform parked on a flat and level surface
  - Disconnect the battery by turning the main power disconnect switch to the “OFF” position.
- Repair any damaged or malfunction components before operating aerial platform.
- Keep records on all inspections.

Maintenance Instructions

This manual consists of four schedules to be done for maintaining on an aerial platform. Inspection schedule frequency is shown below:

Inspection Schedule

Daily	A
Frequently	A + B
Annually	A + B + C
Bi-annually	A + B + C + D

- Make copies of the maintenance and inspection checklist to be used for each inspection.
- Check the schedule on the checklist for the type of inspection to be performed.
- Place a check in the appropriate box after each inspection procedure is completed.
- Use the maintenance and inspection checklist and step-by-step procedures in section 5 to perform these inspections.
- If any inspection receives a fail, tag and remove the aerial platform from service.
- If any aerial platform component(s) has been repaired, an inspection must be performed again before removing the tag. Place a check in the repair column.

Legend

P = Pass
F = Fail
R = Repaired

Table 1.1 Owner's Annual Inspection Record

Model Number: _____					Serial Number: _____				
Recording Date									
Recording Year #	1	2	3	4	5	6	7	8	9
Owner's Name									
Inspected By									

60564AA

As described earlier in this section, this decal is located on the control compartment cowling. It must be completed after an annual inspection has been completed. Do not use the aerial platform if an inspection has not been recorded in the last 13 months.

Table 1.2 MAINTENANCE AND INSPECTION CHECKLIST

Serial Number: _____

Model: _____

Hourmeter Reading: _____ Name (Printed): _____

Date: _____

Time: _____ Signature: _____

Each item shall be inspected using the the appropriate section of the Skyjack service manual.
As each item is inspected, write the apropriate grade in the box.

P - PASS
F - FAIL
R - REPAIRED

INSPECTION FREQUENCY

- ❑ DAILY
- ❑ FREQUENTLY
- ❑ ANNUALLY
- ❑ BI-ANNUALLY

Inspection Schedule	
Daily	A
Frequently*†	A + B
Annually†	A + B + C
Bi-annually†	A + B + C + D

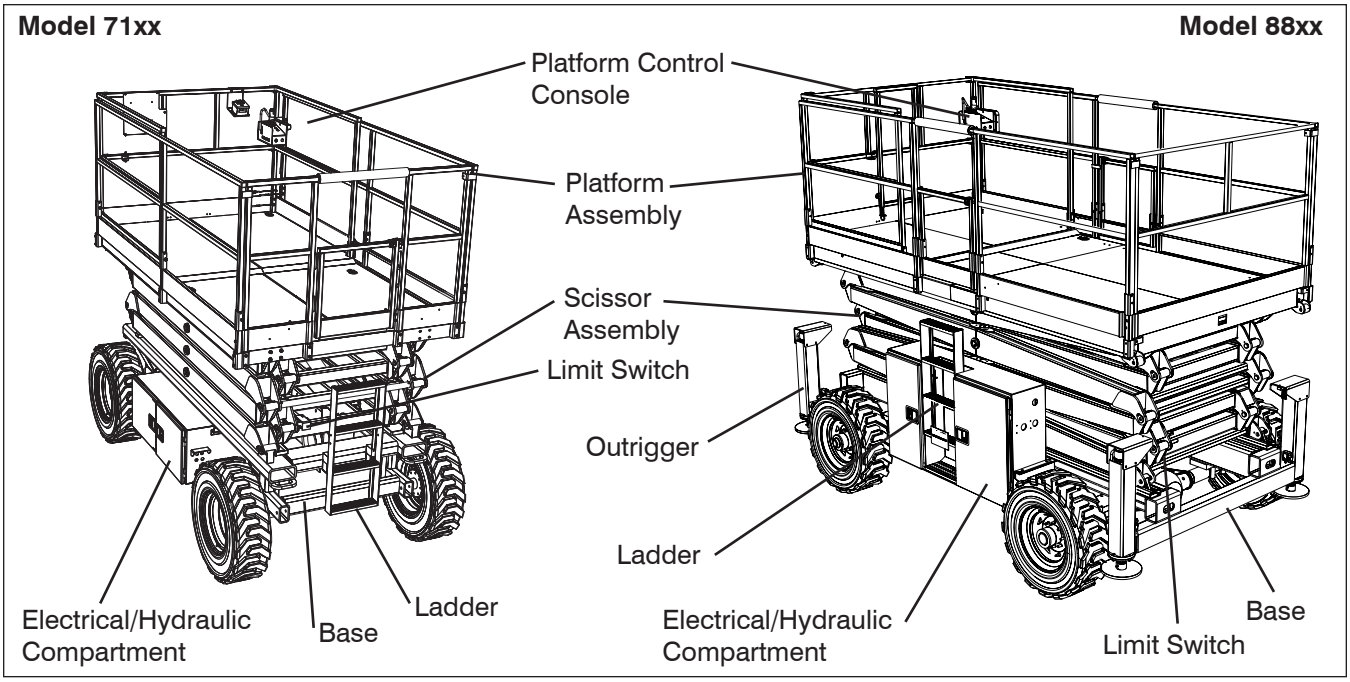
Schedule		P	F	R
Schedule Maintenance Inspections				
Labels	A			
Limit Switches	A, B			
Emergency Lowering Access Rod (If Equipped)	A, B			
Electrical and Control Components				
Main Power Disconnect Switch	A, B			
Base Control Switches	A, B			
Battery	A, B			
Manifolds	A, B, C			
Electrical Panel	A, B			
Tilt Sensor (If Equipped)	A, B			
Load/Tilt Sensor - CE	A, B			
Engine Compartment				
Engine Control Console	A, B			
Radiator	A, B, C			
Muffler and Exhaust	A, B			
Engine Tray	A, B			
Hydraulic Pump	A, B			
Engine Air Filter	A, B			
Engine Oil Level	A, B			
Engine Fuel Filter	A, B, C			
Fuel and Hydaulic Oil Supply				
Fuel Tank	A, B			
Fuel Leaks	A, B			
Hydraulic Tank	A, B, C			
Hydraulic Oil	A, B, C			
Platform Assembly				
Lanyard Attachment Anchors	A			
AC Outlet on Platform	A, B			
Platform Control Console	A, B			
Powered Extension Control Console (If Equipped)	A, B			
Lift Mechanism				
Scissor Guards (If Equipped)	A, B			
Sliders	A, B			
Maintenance Support	A, B			
Scissor Assembly	A, B			
Scissor Bumpers	A, B			
Lift Cylinder(s)	A, B			

Schedule		P	F	R
Base				
Base Weldment	A, B			
Wheel/Tire Assembly	A, B			
Axles	A, B			
Steer Cylinder Assembly	A, B			
Tie Rod	A, B			
Ladder	A, B			
Outriggers (If Equipped)	A, B			
Manual	A, B			
Function Tests				
Platform Control Console				
Test Emergency Stop	A, B			
Test Lift Enable	A, B			
Test Platform Raising/Lowering	A, B			
Test Enable Trigger Switch	A, B			
Test Steering	A, B			
Test Horn	A, B			
Test Driving	A, B			
Test Brake	A, B			
Test Speed Limit	A, B			
Test Lowering Warning - CE	A, B			
Test Powerdeck Enable (If equipped)	A, B			
Test Extension Platform(s) (If equipped)	A, B			
Test Tilt Sensor (If Equipped)	A, B			
Base Control Console				
Test Emergency Stop	A, B			
Test Base Lift Enable	A, B			
Test Lower/Neutral/Raise Switch	A, B			
Test Emergency Lowering (Models 71xx, 8831/41 & 9241)	A, B			
Test Emergency Lowering (Model 8243, 8850 & 9250)	A, B			
Test Emergnecy Powered Extension Platform Retraction Switch (Model 8850 & CE - 9250)	A, B			
Test Main Power Discconect Switch	A, B			

110AC

A - Perform Visual and Daily Maintenance Inspections & Functions Test. Refer to Section 2.7 of the Operating Manual.
B - Perform Scheduled Maintenance Inspection every three months or 150 hrs. Refer to Section 1.0 of this manual.
C - Perform Scheduled Maintenance Inspection every year. Refer to Section 1.0 of this manual.
D - Perform Scheduled Maintenance Inspection every 2 years. Refer to Section 1.0 of this manual.
***** Perform scheduled inspection every three months or 150 hours.
† Refer to Skyjack's webiste @ www.skyjack.com for latest service bulletins prior to performing quarterly or yearly inspection.

Note: Make a copy of this page or visit the Skyjack web site:www.skyjack.com for a printable copy.



1.1 Scheduled Maintenance Inspections

Begin the scheduled maintenance inspections by checking each item in sequence for the conditions listed in this section.

WARNING

To avoid injury, do not operate an aerial platform until all malfunctions have been corrected.

WARNING

To avoid possible injury, ensure aerial platform power is off during your visual and daily maintenance inspections.

Electrical

Maintaining the electrical components is essential to good performance and service life of the aerial platform.

Inspect the following areas for chafed, corroded and loose wires:

- base to platform cables and wiring harness
- engine compartment electrical panel
- engine wiring harness
- hydraulic/electrical wiring harnesses

Hydraulic

Maintaining the hydraulic components is essential to good performance and service life of the aerial platform.

Perform a visual inspection around the following areas:

- hydraulic tank filter, fittings, hoses, emergency power unit (if equipped) and base surfaces
- engine compartment fittings, hoses, main pump, and filter
- all hydraulic cylinders
- all hydraulic manifolds
- the underside of the base
- ground area under the aerial platform
- outriggers

1.1-1 Labels

Refer to the labels section in this manual and determine that all labels are in place and are legible.

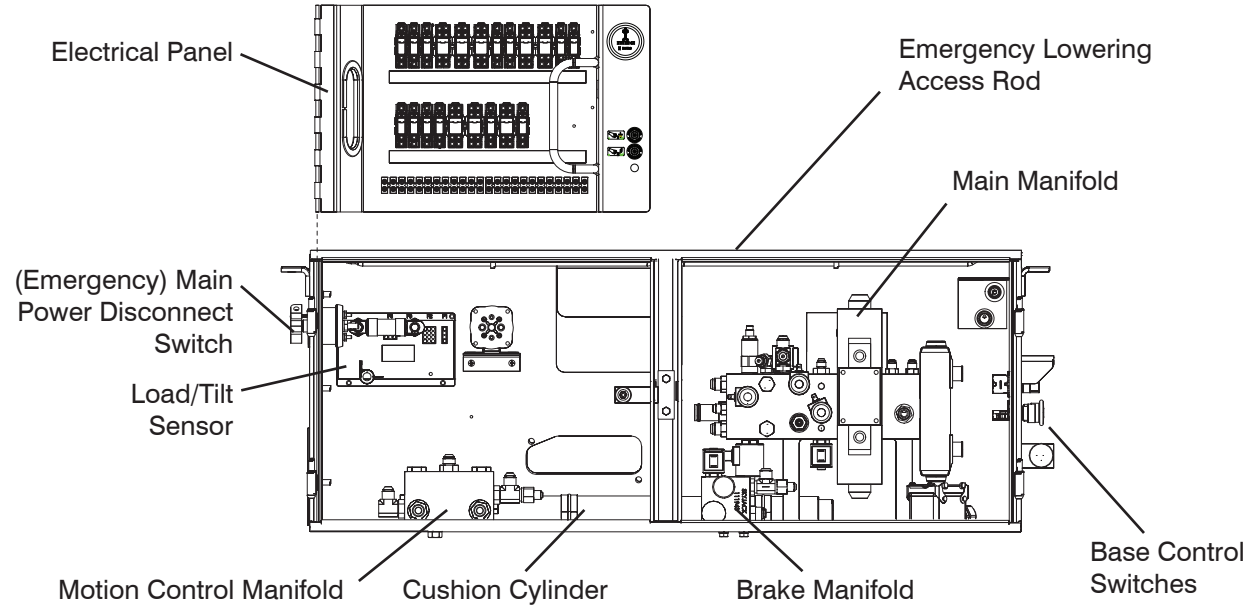
1.1-2 Limit Switches

Detecting limit switch malfunction is essential to safe aerial platform operation. Ensure limit switches are properly secured with no signs of visible damage and movement is not obstructed.

Visually inspect all limit switch located inside the scissor arms and the outrigger assemblies for the following:

- broken or missing actuator arm
- missing fasteners
- loose wiring

Typical Model 71xx shown



1.1-3 Emergency Lowering Access Rod (All models except 9250)

- Ensure rod is properly secured and there is no visible damage.

1.1-4 Electrical and Control Components

- Ensure all compartment latches are secure and in proper working order.

- **Main Power Disconnect Switch**
  - Turn main power disconnect switch to "◯" off position.
  - Ensure all cables are secure and switch is in proper working condition.

- **Base Control Switches**
  - Ensure there are no signs of visible damage and all switches are in their neutral positions.

- **Battery**
  Proper battery condition is essential to good performance and operational safety. Improper fluid levels or damaged cables and connections can result in component damage and hazardous conditions.

WARNING

Explosion hazard. Keep flames and sparks away. Do not smoke near batteries.

WARNING

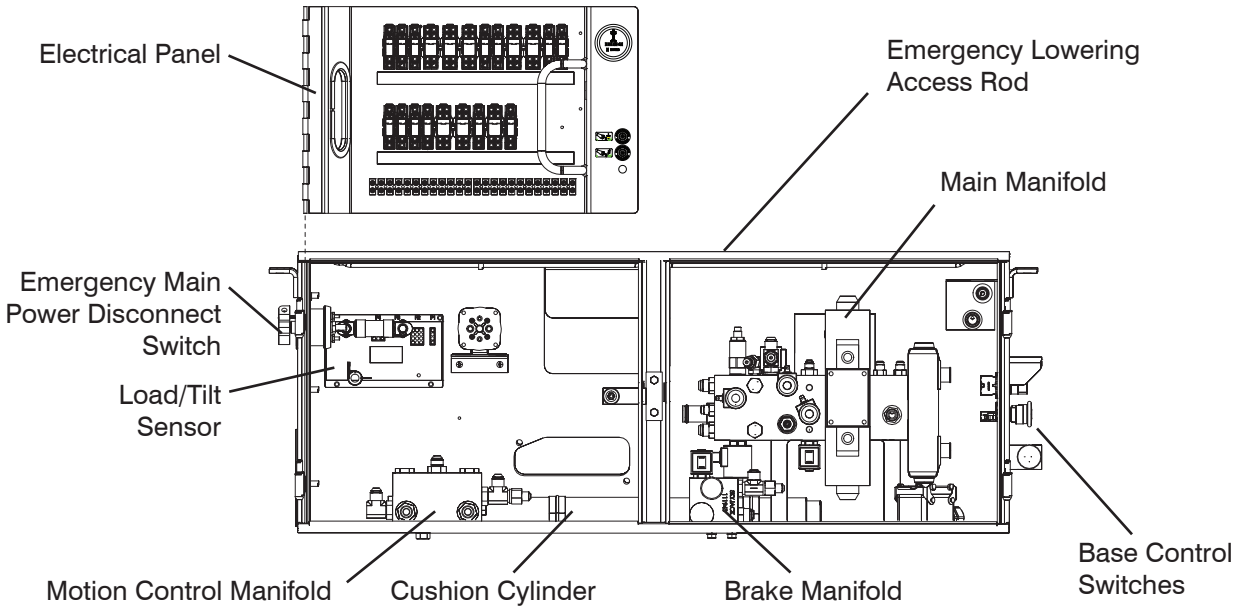
Battery acid is extremely corrosive - Wear proper eye and facial protection as well as appropriate protective clothing. If contact occurs, immediately flush with cold water and seek medical attention.

1. Check battery case for damage.
2. Clean battery terminals and cable ends thoroughly with a terminal cleaning tool or wire brush.
3. Ensure all battery connections are tight.
4. If applicable, check battery fluid level. If plates are not covered by at least 1/2 in. (13 mm) of solution, add distilled or demineralized water.
5. Replace battery if damaged or incapable of holding a lasting charge.

WARNING

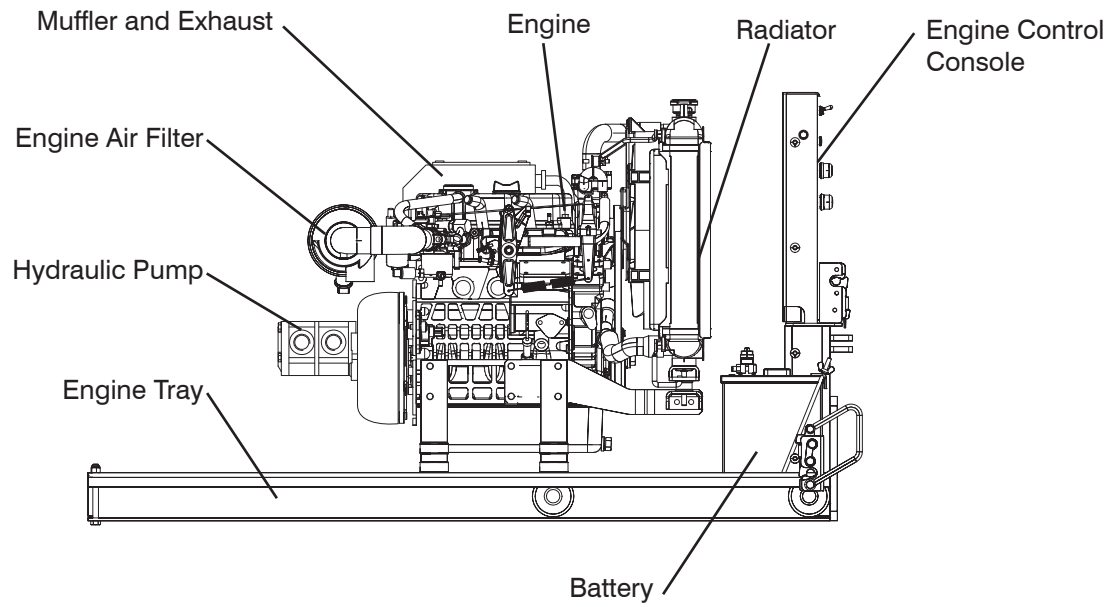
Use original or manufacturer-approved parts and components for the aerial platform.

Typical Model 71xx shown



- **Manifolds**
  - Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.
  - Ensure there are no loose wires or missing fasteners.
- **Electrical Panel**
  - Ensure panel is properly secured and there is no visible damage.
  - Ensure there are no loose wires or missing fasteners.
- **Tilt Sensor (If Equipped)**
  - Ensure tilt sensor is properly secured and there is no visible damage.
- **Load/Tilt Sensor - CE**
  - Ensure load/tilt sensor is properly secure and there is no visible damage.

Typical Model 71xx shown



1.1-5 Engine Compartment

WARNING

Beware of hot engine components.

1. Pull on the two latches to pull out engine compartment.

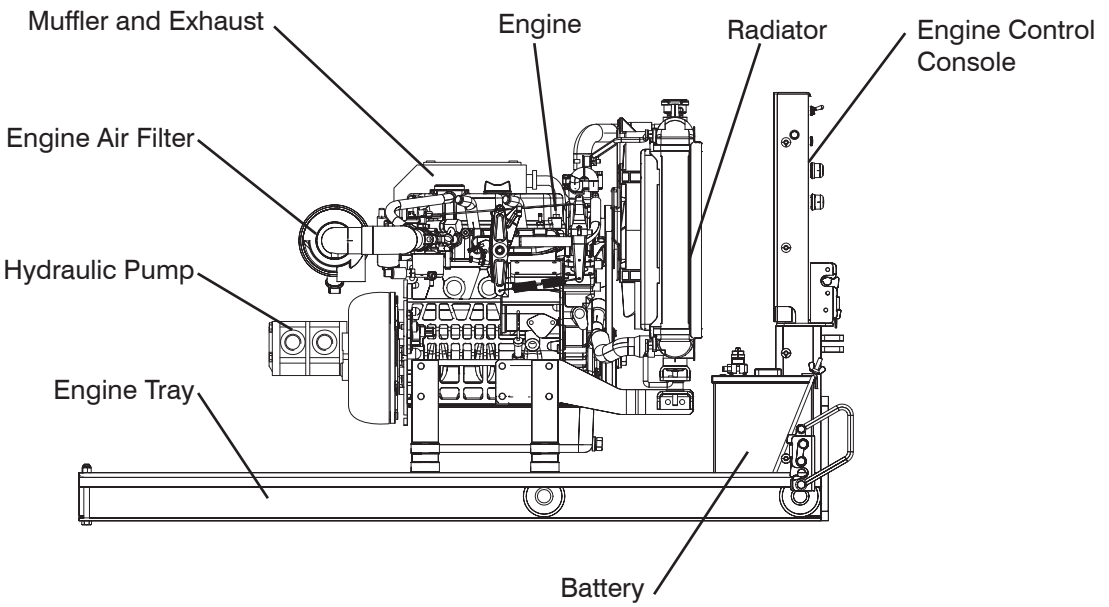
- **Engine Control Console**
  - Ensure muffler and exhaust system are properly secured, with no evidence of damage.
- **Radiator**
  - Ensure radiator is secure.
  - Ensure there are no loose or missing parts and there is no visible damage.
  - Check coolant level and add as needed.

C - Annual Inspection

  - For recommand coolant change, refer to engine manual.

- **Muffler and Exhaust**
  - Ensure muffler and exhaust system are properly secured, with no evidence of damage.
- **Engine Tray**
  - Ensure there are no loose or missing parts and no visible damage to the engine tray. Ensure that both tray-securing bolts are in place.
- **Hydraulic Pump**
  - Ensure there are no loose or missing parts and there is no visible damage.
  - Ensure all bolts are properly tightened.
  - Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.

Typical Model 71xx shown



- **Engine Air Filter**
  - Ensure there are no loose or missing parts and there is no visible damage.

  B - Frequent Inspection
  - For engine air filter maintenance procedure, refer to engine manual.

  C - Annual Inspection
  - For engine air filter replacement procedure, refer to engine manual.

- **Engine Oil Level**
  - Maintaining the engine components is essential to good performance and service life of the aerial platform.

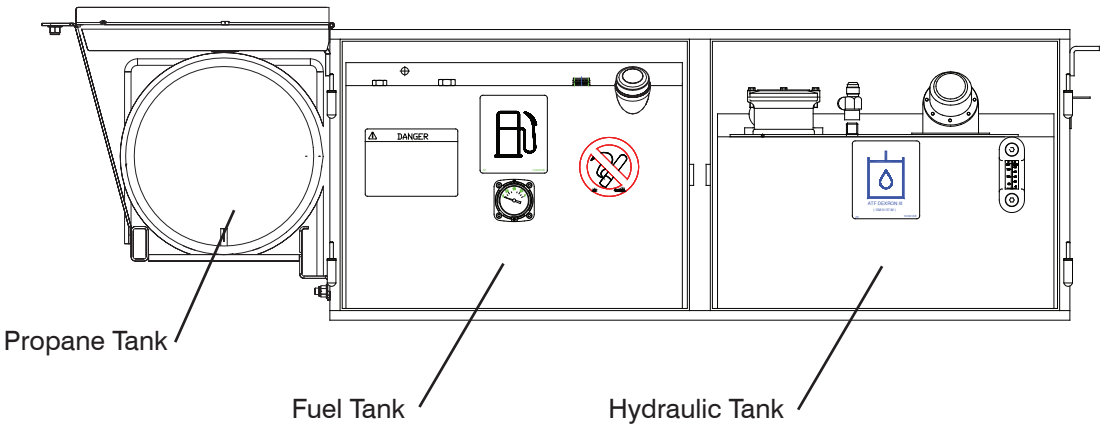
  Check oil level on dipstick
  - Oil level should be between the “L” and “H” marks.

  B - Frequent Inspection
  - For recommand oil change, refer to engine manual

- **Enigne Fuel Filter**
  - Ensure there are no loose or missing parts and there is no visible damage.

  C - Annual Inspection
  - For engine fuel filter replacement procedure, refer to engine manual.

Typical Model 71xx shown



1.1-6 Fuel and Hydraulic Oil Supply

- **Fuel Tank**

IMPORTANT

Before using your aerial platform ensure there is enough fuel for expected use.

  - Ensure fuel filler cap is secure.
  - Ensure tank shows no visible damage and no evidence of fuel leakage.

- **Fuel Leaks**
  - Ensure there are no fuel leaks.

DANGER

Engine fuels are combustible. Inspect the aerial platform in an open, well-ventilated area away from heaters, sparks and flames. Always have an approved fire extinguisher within easy reach.

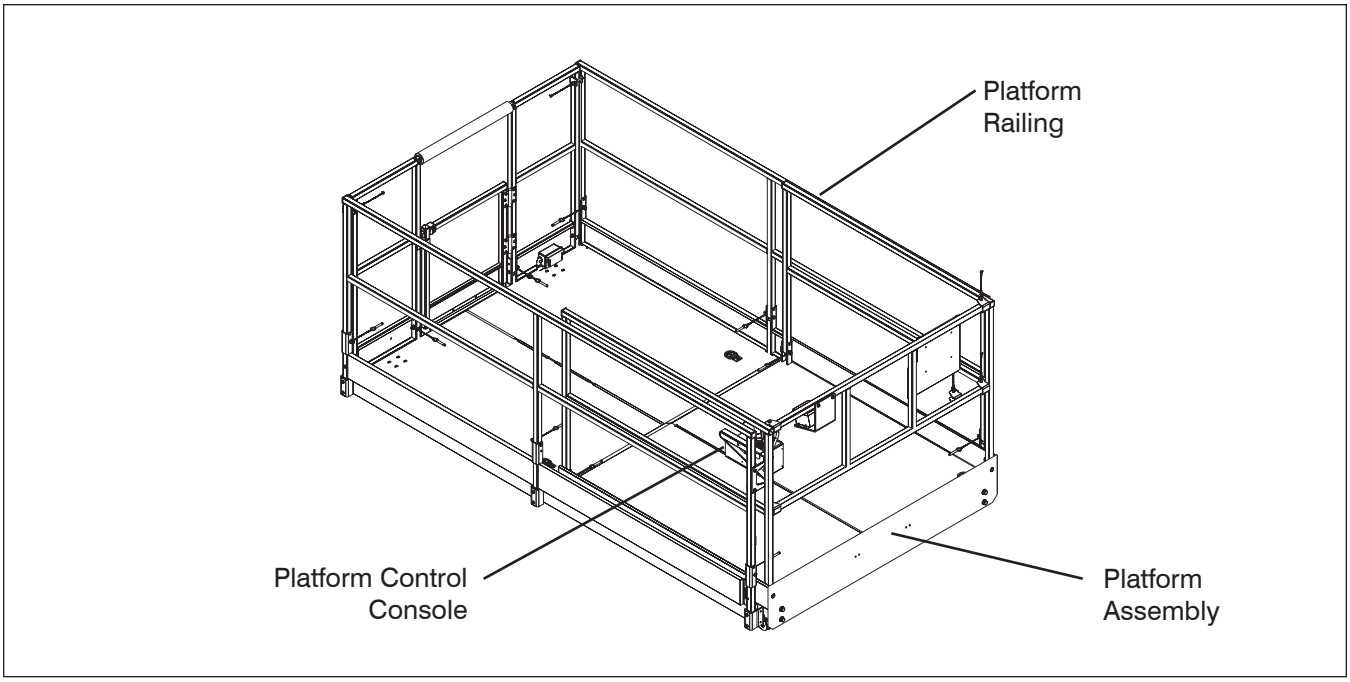
  - Ensure fuel pump, fuel filter, hoses and fittings show no visible damage and no evidence of fuel leakage.

- **Hydraulic Tank**
  - Ensure hydraulic filler cap is secure.
  - Ensure tank shows no visible damage and no evidence of hydraulic leakage.

- **Hydraulic Oil**
  - Ensure platform is fully lowered, and outriggers retracted, and then visually inspect the sight gauge located on the side of the hydraulic oil tank. Check oil level against label that indicates minimum and maximum oil levels.

C - Annual Inspection

  - For hydraulic oil replacement procedure, refer to section 5.



1.1-7 Platform Assembly

WARNING

Ensure that you maintain three points of contact to mount/dismount platform.

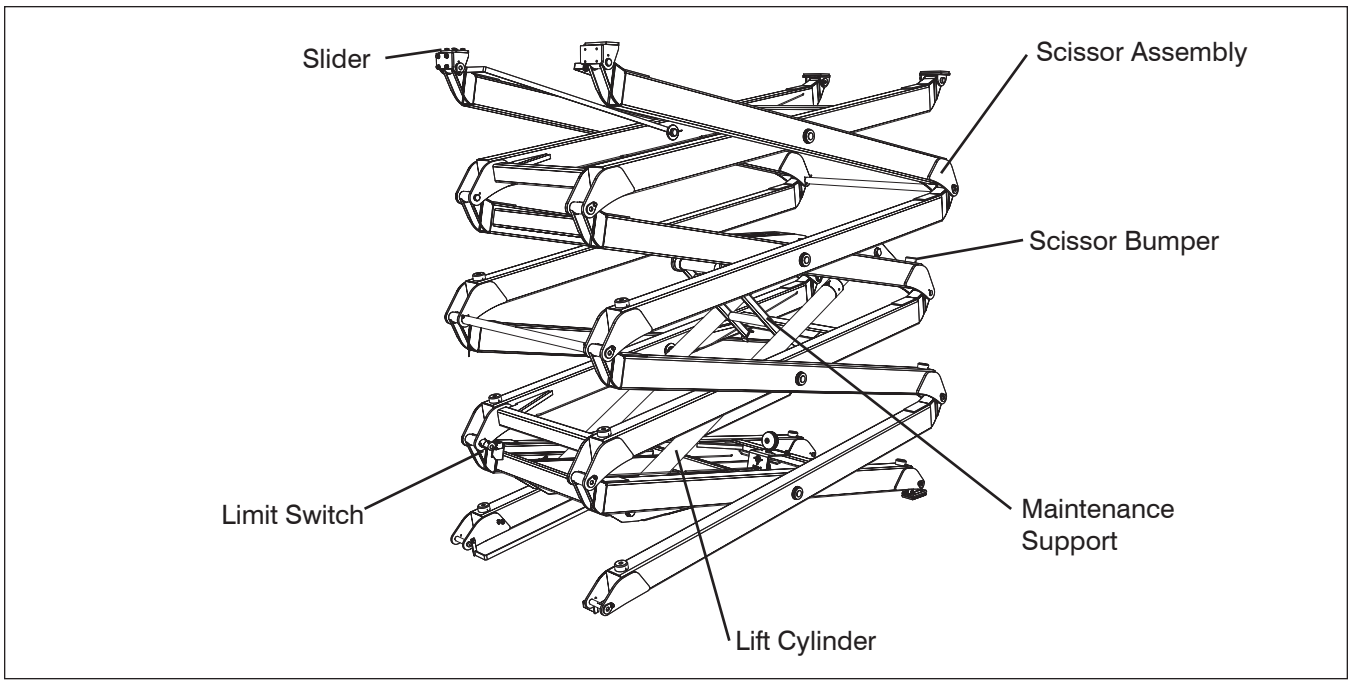
1. Use the ladder of aerial platform to access platform.
2. Close the gate.
   - Ensure there are no loose or missing parts and there is no visible damage.
   - Ensure all fasteners are securely in place.
   - Ensure all railings are properly positioned and secured.
   - Ensure gate is in good working order.

- **Lanyard Attachment Anchors**
  - Ensure attachment rings are secure and have no visible damage.
- **AC Outlet on Platform**
  - Ensure outlet has no visible damage and free from dirt or obstructions.
- **Platform Control Console**
  - Ensure all switches and controller are returned to neutral and are properly secured.
  - Ensure there are no loose or missing parts and there is no visible damage.
- **Powered Extension Control Console (If Equipped)**
  - Ensure all switches are returned to neutral and are properly secured.
  - Ensure there are no loose or missing parts and there is no visible damage.

WARNING

Ensure that you maintain three points of contact to mount/dismount platform.

3. Use the ladder to dismount from platform.



1.1-8 Lifting Mechanism

- **Scissor Guards (If Equipped)**
  - Ensure there are no loose or missing parts and there is no visible damage.
- **Sliders**
  - Ensure sliders are secure and there is no visible damage.
  - Ensure sliders' path of travel are free from dirt and obstructions.

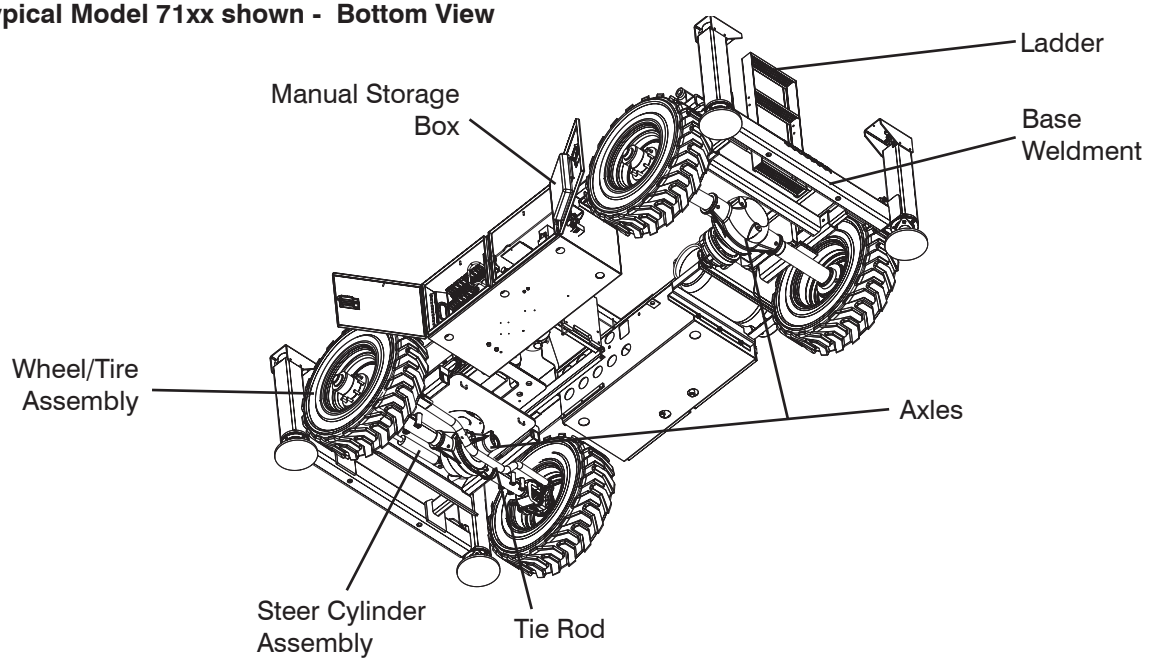
1. Raise the platform until there is adequate clearance to swing down the maintenance support.

- **Maintenance Support**
  - Ensure maintenance support is properly secured and shows no visible damage.
- **Scissor Assembly**
  - Ensure scissor assembly shows no visible damage and no signs of deformation in weldments.
  - Ensure all pins are properly secured.
  - Ensure cables and wires are properly routed and shows no signs of wear and/or physical damage.
- **Scissor Bumpers**
  - Ensure bumpers are secure and shows no sign of visible damage.
- **Lift Cylinder(s)**
  - Ensure each lift cylinder is properly secured, there are no loose or missing parts and there is no evidence of damage.
  - Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.

2. Raise the platform until there is adequate clearance to swing up the maintenance support into storage bracket.

3. Fully lower the platform.

Typical Model 71xx shown - Bottom View



1.1-9 Base

- **Base Weldment**
  - Ensure there are no visible cracks in welds or structure and there are no signs of deformation.
- **Wheel/Tire Assembly**
  The aerial platform is either equipped with air tires or foam-filled tires. Tire and/or wheel failure could result in an aerial platform tipover. Component damage may also result if problems are not discovered and repaired in a timely fashion.

WARNING

Air filled tires are not permitted on some models. Refer to Table 2.3.

WARNING

An over-inflated tire can explode and may cause death or serious injury.

- Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.
- Check each wheel for damage and cracked welds.
- Check each lug nut for proper torque to ensure none are loose.

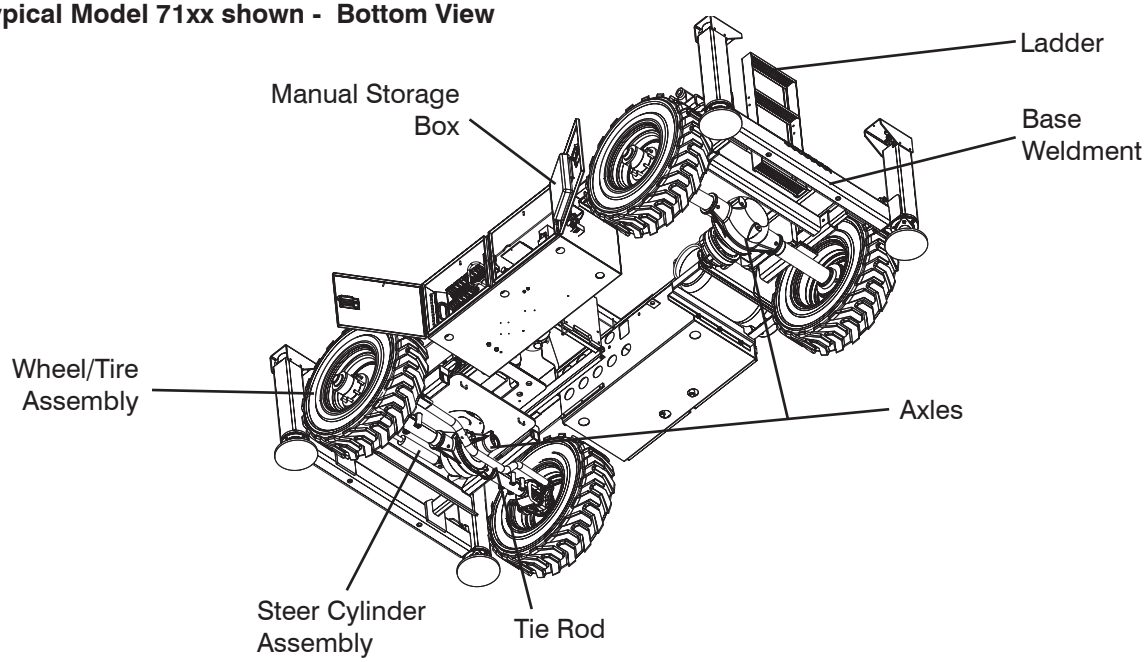
To maximize stability, it is essential to maintain proper pressure in all air-filled tires.

- Check each tire with an air pressure gauge and add air as needed.

Refer to Table 2.3 for wheel/tire specifications.

- **Axles**
  - Ensure axles are properly secured, there are no loose or missing parts, all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.
- **Steer Cylinder Assembly**
  - Ensure steer cylinder assembly is properly secured, there are no loose or missing parts, all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.
- **Tie Rod**
  - Ensure there are no loose or missing parts, tie rod end studs are locked and there is no visible damage.

Typical Model 71xx shown - Bottom View

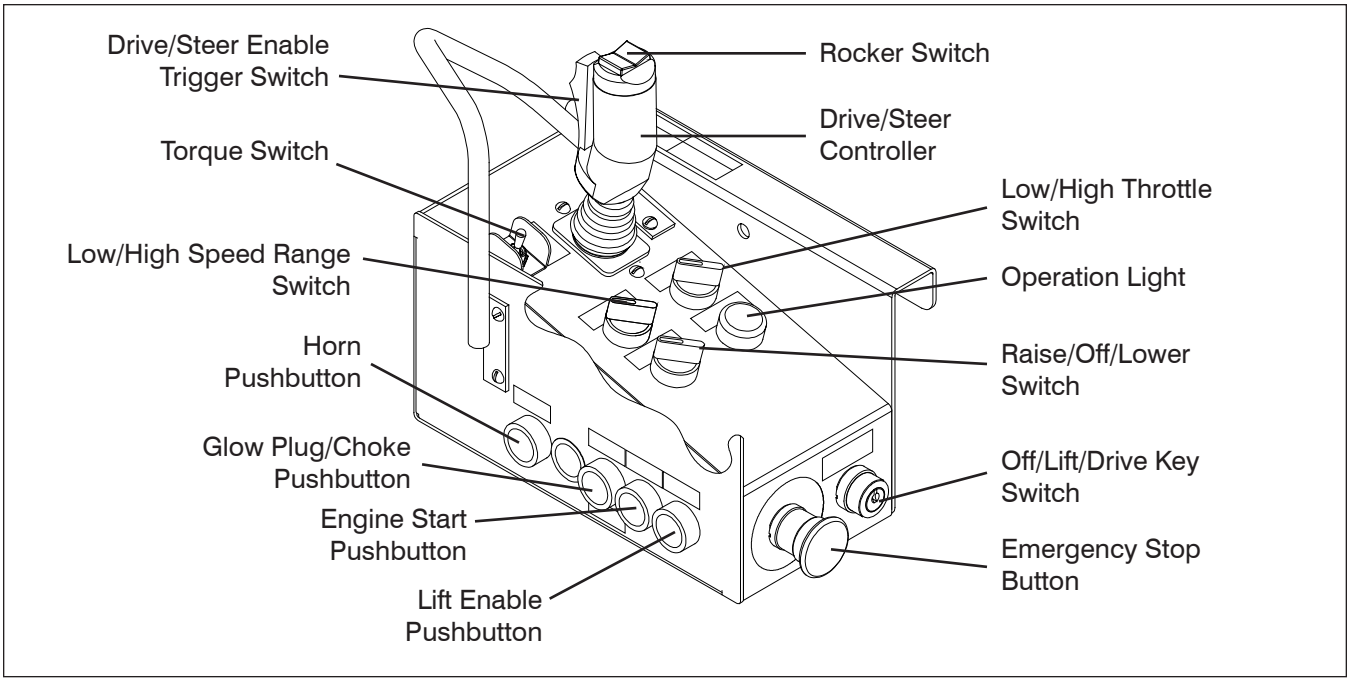


- **Ladder**
  - Ensure there are no loose or missing parts and there is no visible damage.
- **Outriggers (If Equipped)**
  - Ensure there are no loose or missing parts and there is no visible damage.

1.1-10 Manuals

Ensure a copy of operating manual, and other important documents are enclosed in manual storage box.

- Check to be sure manual storage box is present and in good condition.
- Ensure manuals are legible and in good condition.
- Always return manuals to the manual storage box after use.



1.2 Function Tests

Function tests are designed to discover any malfunctions before aerial platform is put into service. The operator must understand and follow step-by-step instructions to test all aerial platform functions.

WARNING

Never use a malfunctioning aerial platform. If malfunctions are discovered, aerial platform must be tagged and placed out of service. Repairs to aerial platform may only be made by a qualified service technician.

After repairs are completed, operator must perform a pre-operation inspection and a series of function tests again before putting aerial platform into service.

Prior to performing function tests, be sure to read and understand Section 2.10 - Start Operation of the operating manual.

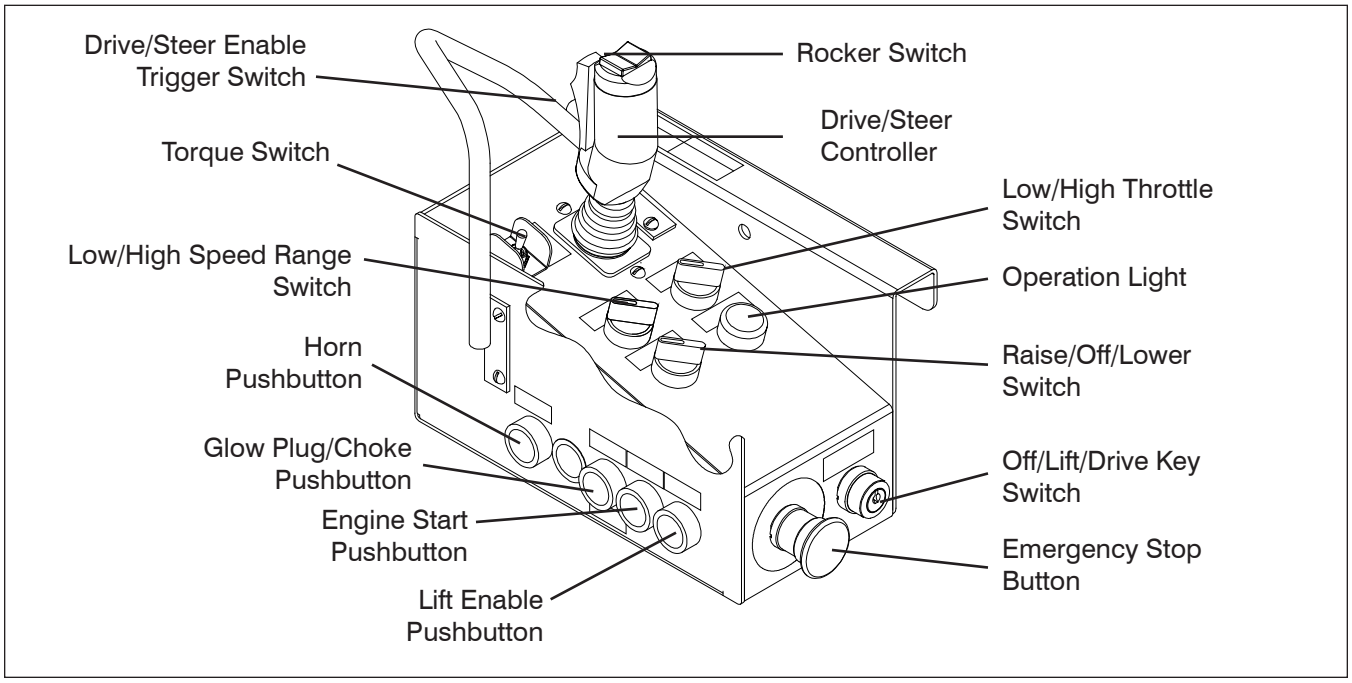
1.2-1 Platform Control Console

1. Turn main power disconnect switch to "|" on position.
2. On base control console, pull out "●" emergency stop button.
3. For CE, select off/platform/base key switch to "" platform position.
4. On engine control console, select off/on/start switch to "|" on position.
5. For ANSI/CSA with dual fuel engine, select fuel supply by moving fuel switch to either "" gasoline or "" liquid propane gas position.

WARNING

Ensure that you maintain three points of contact when using the ladder to mount/ dismount platform.

6. Use the ladder of aerial platform to access platform.
7. Close the gate.
8. On platform control console, insert key into off/lift/ drive key switch and select "↑↓" lift position.
9. Pull out "●" emergency stop button. A beeping sound should be audible and light should come on.



WARNING

If beeping sound is not audible and light does not come on, aerial platform must be tagged and placed out of service.

10. Select low/high throttle switch to "" low throttle position.

CAUTION

Do not start the engine in the high throttle position.

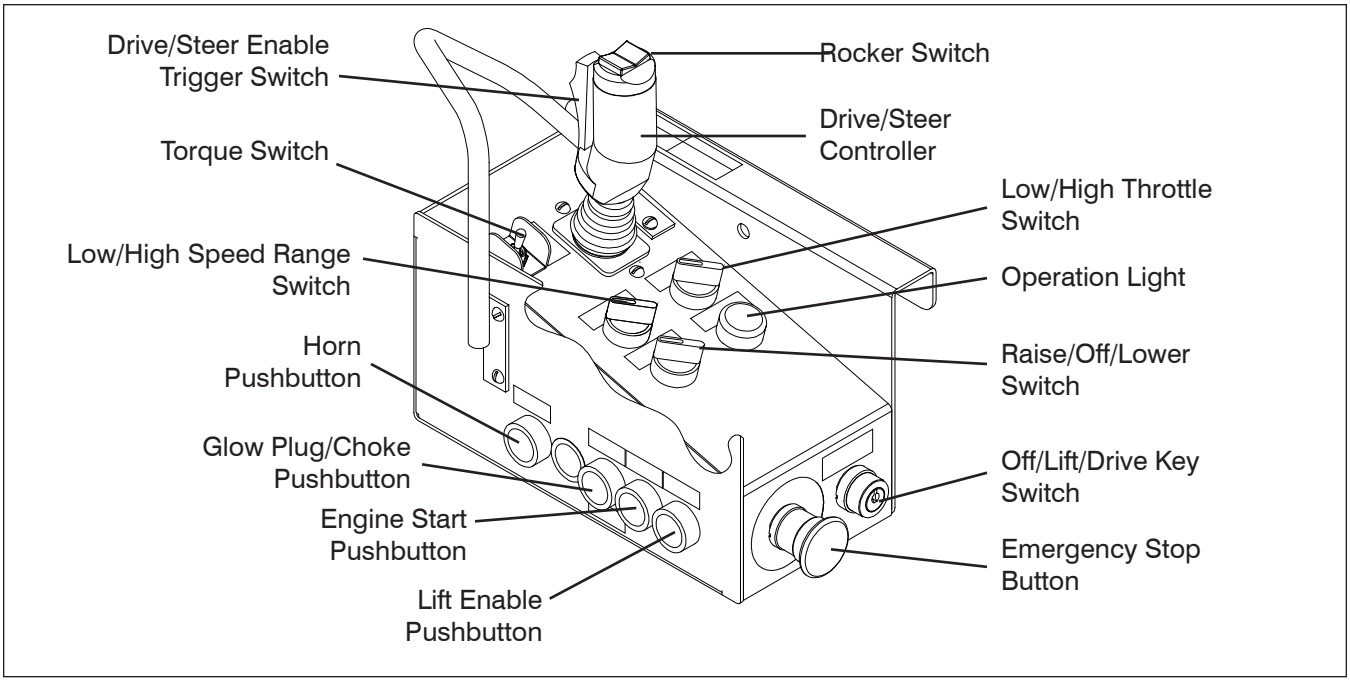
11. To start the engine:

- If (ANSI/CSA) dual fuel engine is cold, depress and hold "" choke pushbutton (if equipped) with engine "" start pushbutton to start the engine.
- If diesel engine is cold, select and hold "" glow plug pushbutton for 15 to 20 seconds or until indicator light goes off. Depress and hold "" engine start pushbutton to start the engine.
- If engine is not cold, depress and hold "" engine start pushbutton to start the engine.
- **Test Emergency Stop**

  1. Push in"" emergency stop button.
     Result: Engine should shut down and aerial platform functions should not operate.

- **Test Lift Enable**

  1. Pull out "" emergency stop button.
  2. Restart the engine.
  3. Select and hold raise/off/lower switch to "" raise position without pressing lift "" enable pushbutton.
     Result: Platform should not rise.



- **Test Platform Raising/Lowering**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

1. Press and hold lift "" enable pushbutton, then select and hold raise/off/lower switch to "" raise position and raise the platform to an approximate height of 1 ft. (30.5 cm). Release switch to stop.
   Result: Platform should rise.
2. Press and hold lift "" enable pushbutton, then select and hold raise/off/lower switch to "" lower position and lower the platform fully. Release switch to stop.
   Result: Platform should lower.

- **Test Enable Trigger Switch**

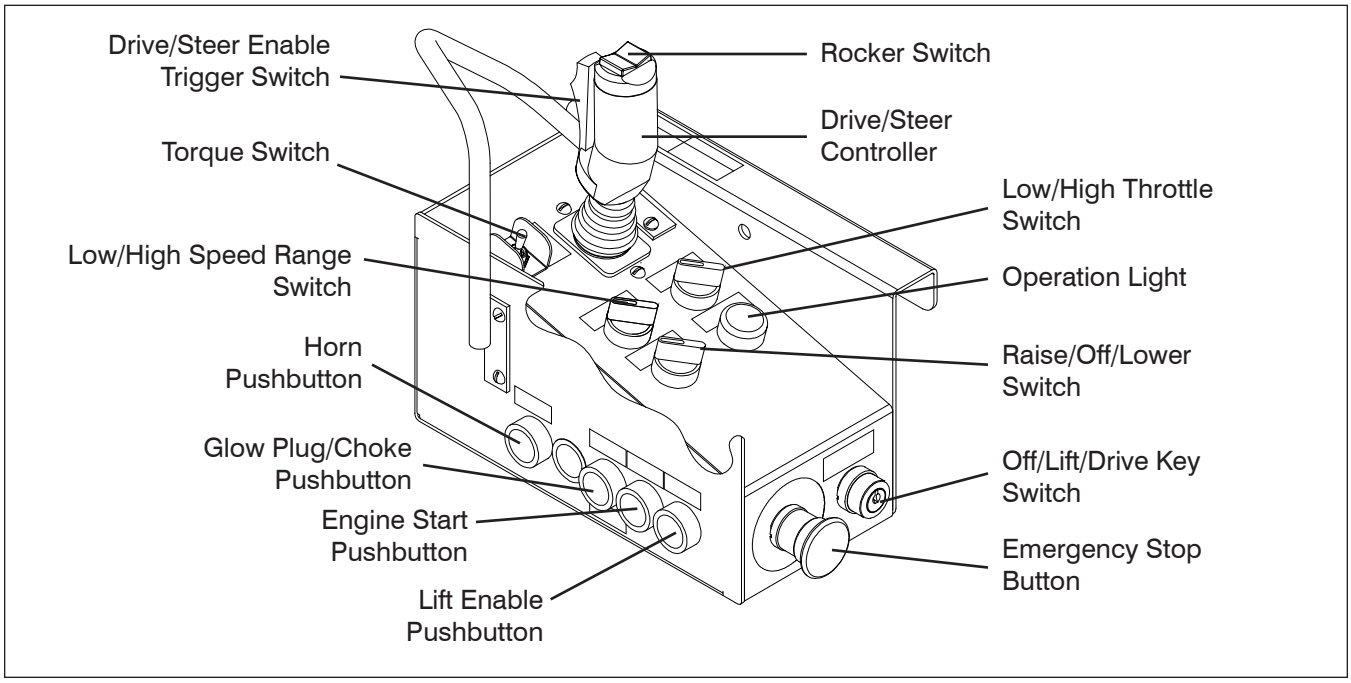
1. Ensure outriggers are fully retracted.
2. Ensure path of intended motion is clear.
3. Select off/lift/drive key switch to "" drive position.
4. Without activating "" enable trigger switch, attempt to drive and steer the aerial platform.
   Result: Drive and steer functions should not operate.

- **Test Steering**

1. Activate and hold enable trigger switch, and then press rocker switch on top of controller to "" left and "" right.
   Result: Steer wheels should turn left and right.

- **Test Horn**

1. Push "" horn pushbutton.
   Result: Horn should sound.



- **Test Driving**

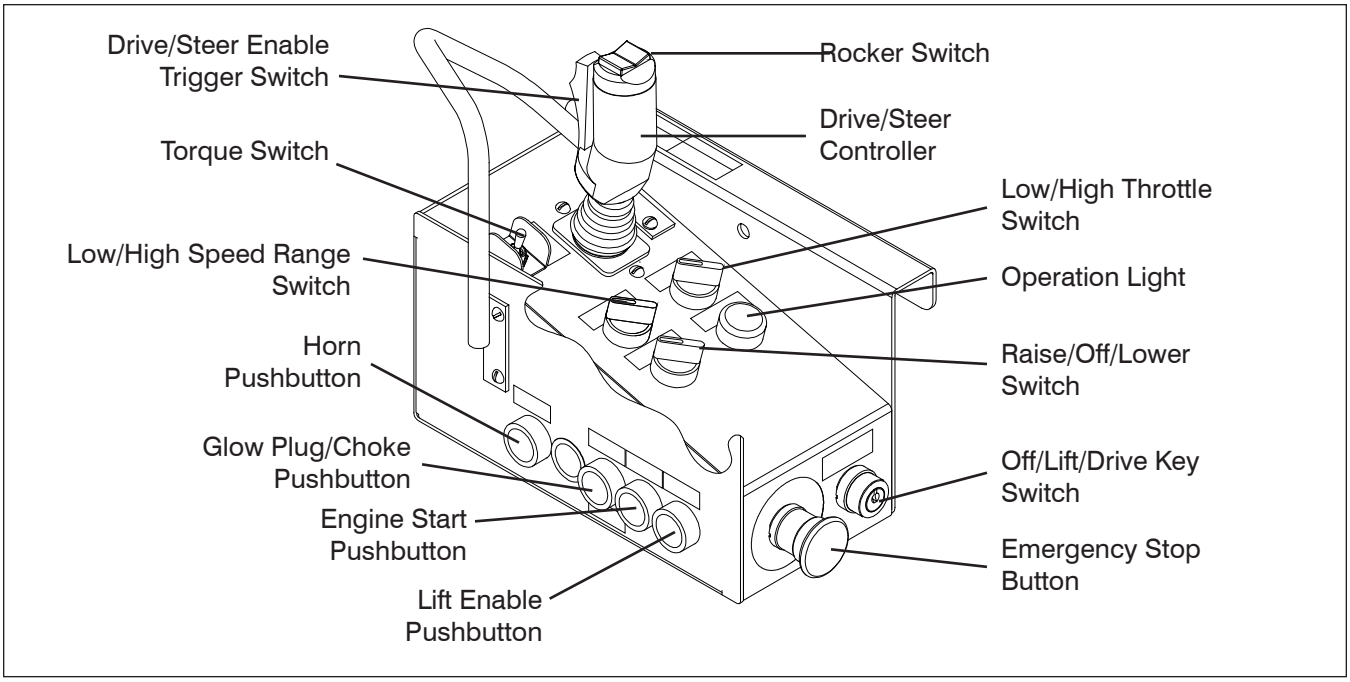
1. Ensure path of intended motion is clear.
2. Activate and hold "" enable trigger switch.
3. Slowly move controller fully "" forward, and then return handle to center position.
   Result: Aerial platform should move in forward direction, and then come to a stop.
4. Slowly move controller fully "" backward, and then return handle to center position.
   Result: Aerial platform should move in reverse direction, and then come to a stop.

- **Test Brake**

WARNING

Brake will engage instantly when controller handle is released, causing aerial platform to stop immediately.

1. Ensure path of intended motion is clear.
2. Activate and hold "" enable trigger switch.
3. Drive aerial platform "" forward. Test brake by releasing controller handle.
   Result: Aerial platform should come to a stop.
4. Drive aerial platform "" forward. Test brake again by releasing "" enable trigger switch only.
   Result: Aerial platform should come to an instant and abrupt stop.



- **Test Speed Limit**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

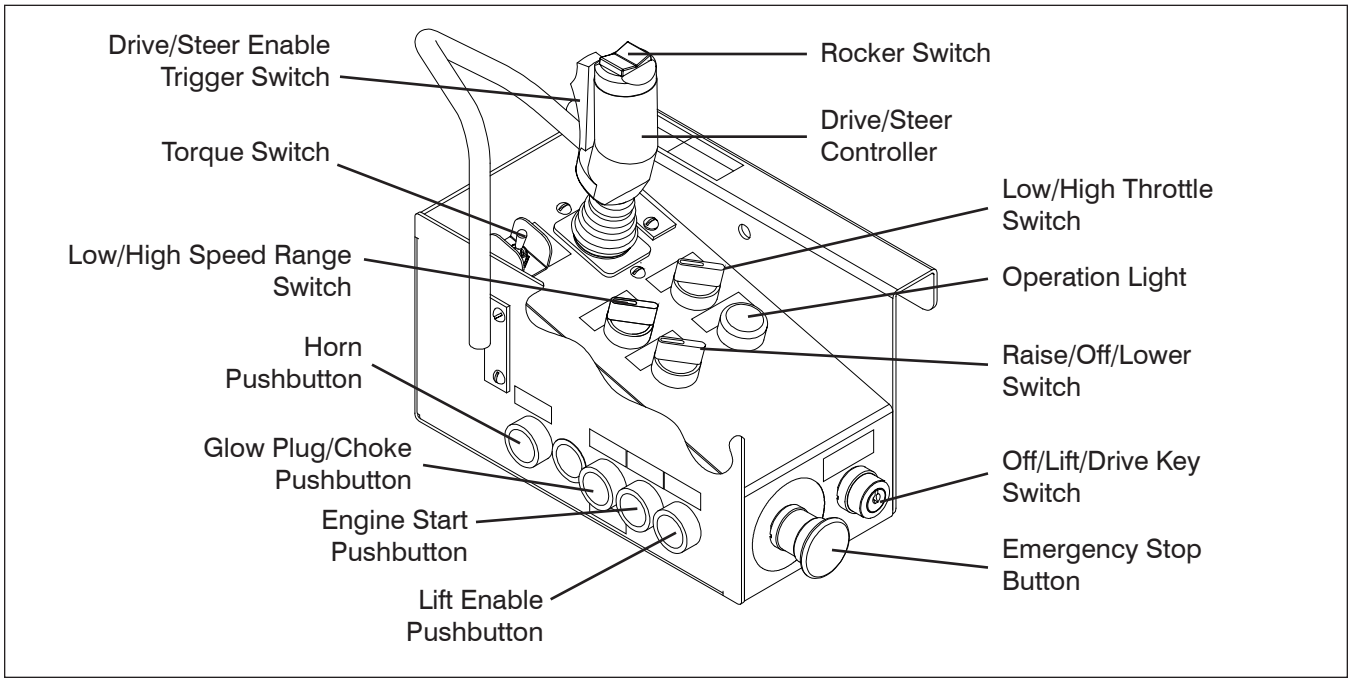
1. Ensure path of intended motion is clear.
2. Select off/lift/drive key switch to "↑↓" lift position.
3. Raise the platform to an approximate height of 13 ft. (4 m).
4. Select off/lift/drive key switch to "" drive position and attempt to drive forward or reverse.
   Result: Aerial platform should move slower than when it was in stowed position.

- **Test Lowering Warning - CE**

1. Select off/lift/drive key switch to "↑↓" lift position.
2. Fully lower the platform.
   Result: Platform should stop lowering at an approximate height of 2.5 meters and an alarm should sound.
3. Release platform raise/off/lower switch, ensure area around scissor is clear, then continue lowering the platform.
4. Lower the platform fully.

- **Test Powerdeck Enable (If Equipped)**

1. Select and hold extend/retract switch to the "" extend position without selecting "" enable switch.
   Result: Platform should not extend.



- **Test Extension Platform(s) (If Equipped)**

  1. Extend each extension platform to about 1 ft. (30.5 cm).
     Result: Each extension platform should extend.

  2. Retract each extension platform fully.
     Result: Each extension platform should fully retract.

- **Test Tilt Sensor (If Equipped)**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

WARNING

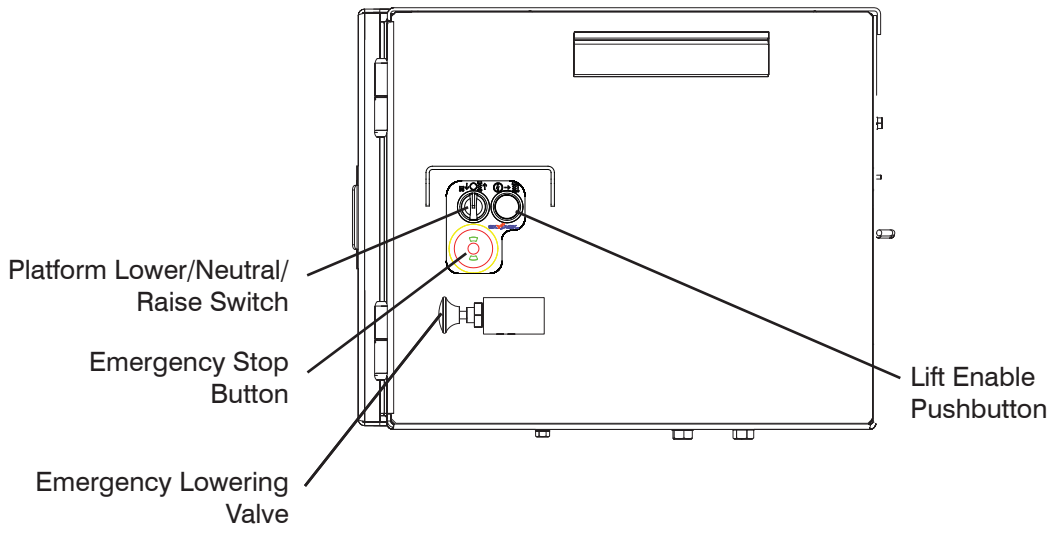
Ensure that there are no personnel or obstructions in the path of travel, including blind spots.

1. Move the aerial platform on to a slope not greater than 4.5°.

2. Use the ladder to dismount from platform.

3. On base control console, slowly raise the platform.
   Result: When platform reaches an appropriate height, a warning signal should sound and platform stop raising as lift and drive controls should be disabled.

Base Control Console



1.2-2 Base Control Console

1. On engine control console, select "" start position to start the engine.

- **Test Emergency Stop**

  1. Push in "" emergency stop button.
     Result: Engine should shut down and aerial platform functions should not operate.

  2. Pull out "" emergency stop button and restart engine.

- **Test Base Lift Enable**

  For ANSI/CSA & AS

  1. On base control console, select and hold lower/neutral/raise switch "" to raise position without selecting "" lift enable switch.
     Result: Platform should not rise.

  For CE

  1. On base control console, select and hold lower/neutral/raise switch "" to raise position without selecting off/platform/base key switch to "" base position.
     Result: Platform should not rise.

- **Test Lower/Neutral/Raise Switch**

  For ANSI/CSA & AS

  1. On base control console, select and hold "" lift enable switch and "" raise the platform with lower/neutral/raise switch.
     Result: Platform should rise.

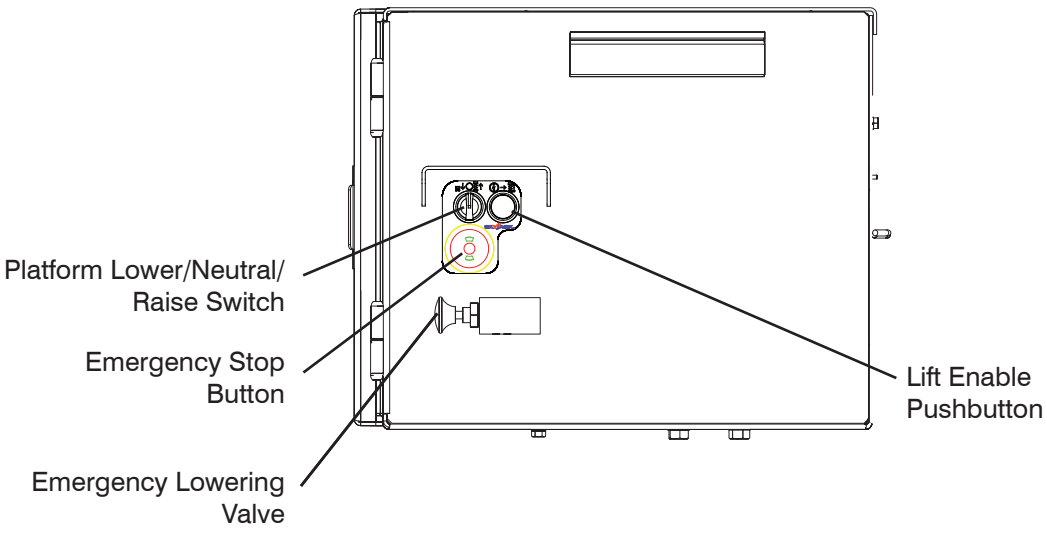
  2. Select and hold "" lift enable switch and fully "" lower the platform with lower/neutral/raise switch.
     Result: Platform should fully lower.

  For CE

  1. On base control console, select and hold off/platform/base key switch to "" base position and "" raise the platform with lower/neutral/raise switch.
     Result: Platform should rise.

  2. Select and hold off/platform/base key switch to "" base position and fully "" lower the platform with lower/neutral/raise switch.
     Result: Platform should fully lower.

Base Control Console



- **Test Emergency Lowering (Models 71xx, 8831/41 & 9241)**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

1. Raise the platform to an approximate height of 13 ft. (4 m).
2. Locate holding valve manual override knob at the base of each lift cylinder. Depress and turn counterclockwise. If necessary, use emergency lowering access rod that is located on the base of the aerial platform.
3. On hydraulic/electrical compartment, pull out and hold emergency lowering valve to fully lower the platform.
   Result: The platform should fully lower.
4. To restore normal operation, depress and turn holding valve manual override knobs clockwise.

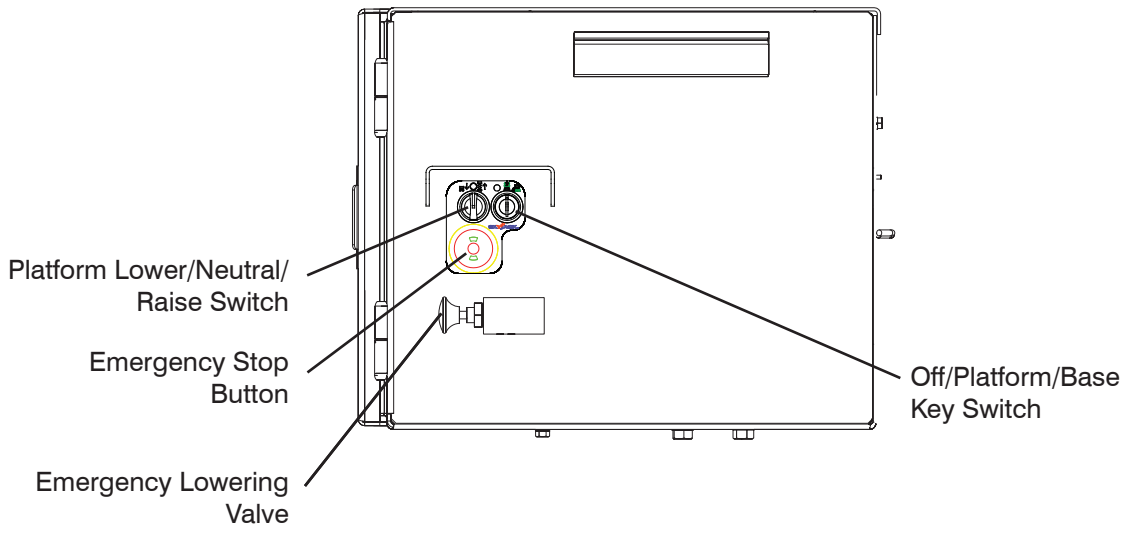
- **Test Emergency Lowering (Model 8243, 8850 & 9250)**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

1. Raise the platform to an approximate height of 13 ft. (4 m).
2. In hydraulic/electrical compartment, depress and hold emergency lowering pushbutton to activate the auxiliary lowering valves. Pull out and hold the emergency lowering valve to fully lower platform.
   Result: The platform should fully lower.

Base Control Console



- **Test Emergency Powered Extension Platform Retraction Switch (Models 8850 & CE - 9250)**

  1. Extend both powered extension platforms to about 0.5 meter.

  2. Push in "" emergency stop button to shut down the engine.

  3. Pull out "" emergency stop button.

  WARNING

  Ensure that you maintain three points of contact when using the ladder to mount/dismount platform.

  4. Use the ladder to dismount from platform.

  5. On hydraulic/electric tray, push the emergency powered extension platform retraction switch.
  Result: Extension platforms should retract.

1.2-4 Test Main Power Disconnect Switch

1. On hydraulic/electrical compartment, turn main power disconnect switch to "◯" off position.
Result: Engine should shut down and aerial platform functions should not operate.

Section 2
MAINTENANCE TABLES AND DIAGRAMS

Table of Contents

Tables

2.1a Specifications and Features - ANSI/CSA 2
2.1b Specifications and Features - CE 3
2.1c Specifications and Features - AS 4
2.2a Maximum Platform Capacities(Evenly Distributed) - ANSI/CSA 6
2.2b Maximum Platform Capacities(Evenly Distributed w/ Optional #7 Tires) - ANSI/CSA 7
2.2c Maximum Platform Capacities(Evenly Distributed) - CE 8
2.2d Maximum Platform Capacities(Evenly Distributed) - AS 9
2.3a Tire Specifications - ANSI/CSA 10
2.3b Tire Specifications - CE 11
2.3c Tire Specifications - AS 12
2.4a Floor Loading Pressure - ANSI/CSA 15
2.4b Floor Loading Pressure - CE 16
2.4c Floor Loading Pressure - AS 17
2.5 Rough Terrain Scissor Fluids 18
2.6 Torque Specifications 20

Table 2.1a Specifications and Features - ANSI/CSA

MODEL		Mid Size RTs				Full Size RTs		
		7127	7135	8243	8850	8831	8841	9250
Weight*		8,420 lb. 3819 kg	8,850 lb. 4014 kg	10,600 lb. 4808 kg	11,460 lb. 5198 kg	9,670 lb. 4386 kg	10,570 lb. 4794 kg	14,700 lb. 6668 kg
Width		71.5” 1.82 m				87” 2.21 m		92” 2.34 m
Length		150” 3.81 m				137.5” 3.5 m		176” 4.47 m
Platform Size		64” x 117” 1.63 m x 2.97 m				68” x 133” 1.73 m x 3.39 m		74” x 168” 1.88 m x 4.27 m
Height	Working	33’ 10.1 m	41’ 12.5 m	49’ 14.9 m	56’ 17.1 m	37’ 11.3 m	47’ 14.3 m	56’ 17.1 m
	Platform Elevated	27’ 8.2 m	35’ 10.7 m	43’ 13.1 m	50’ 15.2 m	31’ 9.4 m	41’ 12.5 m	50’ 15.2 m
	Platform Lowered	60.5” 1.54 m	67.5” 1.71 m	75” 1.91 m	82” 2.08 m	59” 1.5 m	69” 1.75 m	79” 2.01 m
	Drive	Full						26’ 7.9 m
Tires		Please refer to Table 2-7 for tire specification and usage.						
Speed	Normal Drive	3.5 mph 5.6 km/h				3.0 mph 4.8 km/h		2.0 mph 3.2 km/h
	Elevated Drive	0.35 mph 0.56 km/h				0.6 mph 0.97 km/h		
	Raise (Rated Load)	43 sec.	41 sec.	45 sec.	46 sec.	58 sec.	56 sec.	67 sec.
	Lower (Rated Load)	46 sec.	44 sec.	58 sec.	52 sec.	44 sec.	53 sec.	72 sec.
Engine (RPM)	Kubota (Dual Fuel)	2050 (Low) / 3500 (High)		N/A				
	Kubota (Diesel)	1400 (Low) / 2800 (High)				1400 (Low) / 2800 (High)		
	GM (Dual Fuel)	N/A		900 (Idle) /1400 (Low) / 2800 (High)				
Gradeability		30%				30%		25%

60348AG-ANSI-R

* Weights are approximate; refer to serial nameplate for specific weight. Values shown are for standard 4WD machines on air tires (except for Model 8850) with a manual extension platform (Mid Size RTs) and no extension platforms (Full Size RTs).

Table 2.1b Specifications and Features - CE

Model		Mid Size RTs		Full Size RTs			
		7127	7135	8831	8841	9241	9250
Weight*		3724 kg	4392 kg	4554 kg	4962 kg	6718 kg	7407 kg
Width		1.82 m		2.21 m		2.34 m	
Length		3.81 m		3.5 m		4.55 m	
Platform Size		1.63 m x 2.97 m		1.73 m x 3.39 m		1.85 m x 4.39 m	
Height	Working	10.2 m	12.7 m	11.4 m	14.5 m	14.5 m	17.2 m
	Platform Elevated	8.2 m	10.7 m	9.4 m	12.5 m	12.5 m	15.2 m
	Platform Lowered	1.54 m	1.73 m	1.50 m	1.75 m	1.68 m	2 m
	Drive	Full		7.9 m		Full	7.9 m
Tires		Refer to Table 2.6 for tire specification and usage.					
Speed	Normal Drive	5.6 km/h		4.8 km/h		3.8 km/h	
	Elevated Drive	0.56 km/h		0.97 km/h		0.72 km/h	
	Raise (Rated Load)	31 sec.	38 sec.	58 sec.	56 sec.	62 sec.	64 sec.
	Lower (Rated Load)	46 sec.	43 sec.	44 sec.	53 sec.	59 sec.	86 sec.
Engine (RPM)	Kubota (Diesel)	1400 (Low) / 2800 (High)		1400 (Low) / 2800 (High)			
Gradeability		30%		30%		25%	25%

60348AI-CE-R

* Weights are approximate; refer to serial nameplate for specific weight. Values shown are for standard 4WD aerial platforms on air tires with a manual extension platform (Models 7127 & 7135) and no extension platforms (Models 8831 & 8841). For models 9241 & 9250, values shown are for standard 4WD on foam tires with two powered extension platforms.

Table 2.1c Specifications and Features - AS

Model		Mid Size RTs				Full Size RTs		
		7127	7135	8243	8850	8831	8841	9250
Weight*		4046 kg	4241 kg	4917 kg	5588 kg	4636 kg	5044 kg	6895 kg
Width		1.82 m		2.08 m	2.31 m	2.21 m		2.34 m
Length		3.81 m		3.58 m		3.5 m		4.47 m
Platform Size		1.63 x 2.97 m		1.64 x 2.93 m		1.73 x 3.39 m		1.88 x 4.27 m
Height	Working	10.1 m	12.5 m	15.1 m	17.2 m	11.28 m	14.3 m	17.1 m
	Platform Elevated	8.2 m	10.7 m	13.1 m	15.2 m	9.4 m	12.5 m	15.2 m
	Platform Lowered	1.54 m	1.73 m	1.9 m	2.08 m	1.50 m	1.75 m	2.01 m
	Drive	Full		Full		Full		7.9 m
Tires		Refer to Table 2.6 for tire specification and usage.						
Speed	Normal Drive	4.8 km/h		4.8 km/h		5.6 km/h	5.6 km/h	3.2 km/h
	Elevated Drive	0.58 km/h		0.45 km/h		0.8 km/h	0.8 km/h	0.8 km/h
	Raise (Rated Load)	31 sec.	38 sec.	48 sec.	47 sec.	58 sec.	56 sec.	67 sec.
	Lower (Rated Load)	46 sec.	43 sec.	52 sec.	61 sec.	44 sec.	53 sec.	72 sec.
Engine (RPM)	Kubota (Diesel)	1400 (Low) / 2800 (High)						
Gradeability		30%				30%		25%

60348AI-AS

* Weights are approximate; refer to serial nameplate for specific weight. Values shown are for standard 2WD aerial platforms on foam-filled tires with a manual extension platform (Mid Size RTs) and no extension platforms (Full Size RTs).

Table 2.2a Maximum Platform Capacities (Evenly Distributed) - ANSI/CSA

MODEL		Total		First Extension		Second Extension	
		Capacity	Number of Occupants	Capacity	Number of Occupants	Capacity	Number of Occupants
7127	One Extension Platform	1500 lb. 681 kg	5	500 lb. 227 kg	2	Not Available	
7135	One Extension Platform	1000 lb. 454 kg	4	350 lb. 159 kg	1	Not Available	
8243	One Extension Platform	1000 lb. 454 kg	3	350 lb. 159 kg	1	Not Available	
8850	One Extension Platform	800 lb. 363 kg	3	300 lb. 136 kg	1	Not Available	
8831	No Extension Platform	2500 lb. 1134 kg	6	Not Available			
	One Extension Platform	2000 lb. 908 kg	6	500 lb. 227 kg	2	Not Available	
	Two Extension Platforms	1700 lb. 771 kg	6	500 lb. 227 kg	2	500 lb. 227 kg	2
8841	No Extension Platform	1700 lb. 771 kg	5	Not Available			
	One Extension Platform	1500 lb. 681 kg	5	500 lb. 227 kg	2	Not Available	
	Two Extension Platforms	1500 lb. 681 kg	5	500 lb. 227 kg	2	500 lb. 227 kg	2
9250	No Extension Platform	2000 lb. 907 kg	5	Not Available			
	One Extension Platform	1500 lb. 681 kg	5	500 lb. 227 kg	2	Not Available	
	Two Extension Platforms	1500 lb. 681 kg	5	500 lb. 227 kg	2	500 lb. 227 kg	2

60376AE-ANSI-R

NOTE:

Occupants and materials are not to exceed rated load.
Capacities listed are for standard machines equipped with #6 tires.
Refer to capacity label at sides of platform for additional information and for models equipped with options.

Table 2.2b Maximum Platform Capacities (Evenly Distributed w/ Optional #7 Tires) - ANSI/CSA

MODEL		Total		First Extension		Second Extension	
		Capacity	Number of Occupants	Capacity	Number of Occupants	Capacity	Number of Occupants
7127	One Extension Platform	1500 lb. 681 kg	5	500 lb. 227 kg	2	Not Available	
7135	One Extension Platform	900 lb. 408 kg	3	300 lb. 136 kg	1	Not Available	
8831	No Extension Platform	2000 lb. 908 kg	6	Not Available			
	One Extension Platform	1700 lb. 771 kg	6	500 lb. 227 kg	2	Not Available	
	Two Extension Platforms	1400 lb. 635 kg	5	500 lb. 227 kg	2	500 lb. 227 kg	2
8841	No Extension Platform	1250 lb. 567 kg	5	Not Available			
	One Extension Platform	1250 lb. 567 kg	5	500 lb. 227 kg	2	Not Available	
	Two Extension Platforms	1250 lb. 567 kg	5	500 lb. 227 kg	2	500 lb. 227 kg	2
9250	No Extension Platform	1500 lb. 681 kg	5	Not Available			
	One Extension Platform	1500 lb. 681 kg	5	500 lb. 227 kg	2	Not Available	
	Two Extension Platforms	1500 lb. 681 kg	5	500 lb. 227 kg	2	500 lb. 227 kg	2

60376AE-ANSI-R

NOTE:

Occupants and materials are not to exceed rated load.
Refer to capacity label at sides of platform for additional information and for models equipped with options.

Table 2.2c Maximum Platform Capacities (Evenly Distributed) - CE

MODEL		Total		First Extension		Second Extension	
		Capacity	Number of Occupants	Capacity	Number of Occupants	Capacity	Number of Occupants
7127	One Extension Platform	681 kg	5	227 kg	2	Not Available	
7135	One Extension Platform	454 kg	4	159 kg	1	Not Available	
8831	No Extension Platform	1134 kg	6	Not Available			
	One Extension Platform	908 kg	6	227 kg	2	Not Available	
	Two Extension Platform	771 kg	6	227 kg	2	227 kg	2
8841	No Extension Platform	771 kg	5	Not Available			
	One Extension Platform	681 kg	5	227 kg	2	Not Available	
	Two Extension Platform	681 kg	5	227 kg	2	227 kg	2
9241	Two Extension Platform	681 kg	5	227 kg	2	227 kg	2
9250	Two Extension Platform	681 kg	5	227 kg	2	227 kg	2

60376AF-CE-R

NOTE:

Occupants and materials are not to exceed rated load.
Capacities listed are for standard machines equipped with #6 tires except for models 9250 and 9241 which are equipped with foam-filled tires.
Refer to capacity label at sides of platform for additional information and for models equipped with options.

BEAUFORT SCALE	Wind Speed				Ground Conditions
	m/s	km/h	ft/s	mph	
3	3.4 – 5.4	12.5 – 19.4	11.5 – 17.75	5 – 12.0	Papers and thin branches move, flags wave
4	5.4 – 8.0	19.4 – 28.8	17.75 – 26.25	12.0 – 18	Dust is raised, paper whirls up, and small branches sway.
5	8.0 – 10.8	28.8 – 38.9	26.25 – 35.5	18 – 24.25	Shrubs with leaves start swaying. Wave crests are apparent in ponds or swamps.
6	10.8 – 13.9	38.9 – 50.0	35.5 – 45.5	24.5 – 31	Tree branches move. Power lines whistle. It is difficult to open an umbrella.
7	13.9 – 17.2	50.0 – 61.9	45.5 – 65.5	31 – 38.5	Whole trees sway. It is difficult to walk against the wind.

60338AC

Table 2.2d Maximum Platform Capacities (Evenly Distributed) - AS

MODEL		Total		First Extension		Second Extension	
		Capacity	Number of Occupants	Capacity	Number of Occupants	Capacity	Number of Occupants
7127	One Extension Platform	681 kg	5	227 kg	2	Not Available	
7135	One Extension Platform	454 kg	4	159 kg	1	Not Available	
8243	One Extension Platform	454 kg	3	159 kg	1	Not Available	
8850	One Extension Platform	363 kg	3	136 kg	1	Not Available	
8831	No Extension Platform	1134 kg	6	Not Available			
	One Extension Platform	908 kg	6	227 kg	2	Not Available	
	Two Extension Platforms	681 kg	6	227 kg	2	227 kg	2
8841	No Extension Platform	771 kg	5	Not Available			
	One Extension Platform	681 kg	5	227 kg	2	Not Available	
	Two Extension Platforms	681 kg	5	227 kg	2	227 kg	2
9250	No Extension Platform	908 kg	5	Not Available			
	One Extension Platform	681 kg	5	227 kg	2	Not Available	
	Two Extension Platforms	681 kg	5	227 kg	2	227 kg	2

60376AE-AS

NOTE:

Occupants AND materials are not to exceed rated load.
Capacities listed are for standard machines equipped with #6 tires except for model 9250A which is equipped with foam filled tires.
Refer to capacity label at sides of platform for additional information and for models equipped with options.

Table 2.3a Tire Specifications - ANSI/CSA

WARNING

Air pressure can affect stability. Temperature changes can affect air pressure. It is important to visually inspect all tires for proper tire inflation prior to use. Tires should be checked by end user on a daily basis. Tire inflation pressures must be checked weekly with a calibrated gauge. If the measured pressure is less than the specification, reinflate to the pressure specified below. Tires must not be inflated above the recommended specification. Do not intermix tires of different types on one aerial platform. Use only tires of type originally supplied.

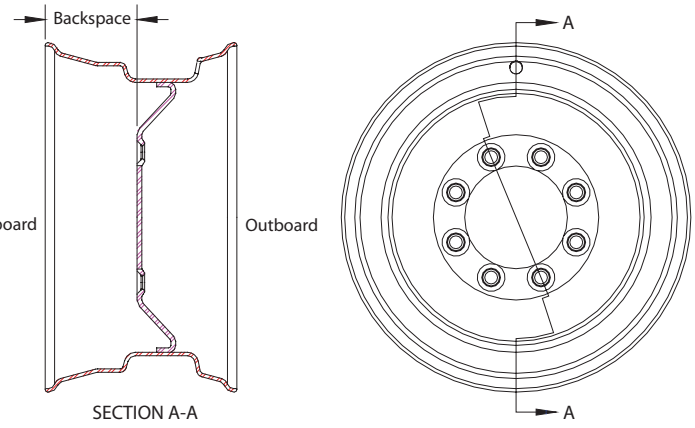
Tire Size		Fill Specification			Usage†						
					MID SIZE				FULL SIZE		
		Fill Type	Ply Rating	Pressure (Factory) (kPa)	7127	7135	8243	8850	8831	8841	9250
#6A	10-16.5 CARLISLE US LOADER	Air	10	75* (517.1)*	S	S	S	N/A	S	S	S
#6A	10-16.5 OTR OUTRIGGER (Non-Marking)		10	75* (517.1)*	O	O	O	N/A	O	O	O
#7A	31-15.5-15 GOODYEAR TERRA XTRAC		8	45* (310.3)*	O	O	O	N/A	O	O	O
#6F	10-16.5 CARLISLE US LOADER	Foam	10	N/A	O	O	O	S	O	O	O
#6F	10-16.5 OTR OUTRIGGER (Non-Marking)		10	N/A	O	O	O	O	O	O	O
#7F	31-15.5-15 GOODYEAR TERRA XTRAC		8	N/A	O	O	O	O	O	O	O

60378AE-ANSI-R

* Factory preset @ 20°**C, Check pressures regularly as tires can lose pressure over time and over different ambient temperatures even under normal conditions.**

† Usage: (**S**)tandard Or (**O**)ptional
(**N/A**) Not Available

Rim Backspace Diagram



Rim Size	Backspace						
	7127	7135	8831	8841	8243	8850	9250
Serial Number	Contact Skyjack Service Department						
#6 & #6F	3-3/4"	3-3/4"	4-3/4"	4-3/4"	3-3/4"	3-3/4"	3-3/4"
	95 mm	95 mm	121mm	121mm	95 mm	95 mm	95 mm
#7 & #7F	All models are 4-3/8"						

60380AC-ANSI

Table 2.3b Tire Specifications - CE

WARNING

Air pressure can affect stability. Temperature changes can affect air pressure. It is important to visually inspect all tires for proper tire inflation prior to use. Tires should be checked by end user on a daily basis. Tire inflation pressures must be checked weekly with a calibrated gauge. If the measured pressure is less than the specification, reinflate to the pressure specified below. Tires must not be inflated above the recommended specification. Do not intermix tires of different types on one aerial platform. Use only tires of type originally supplied.

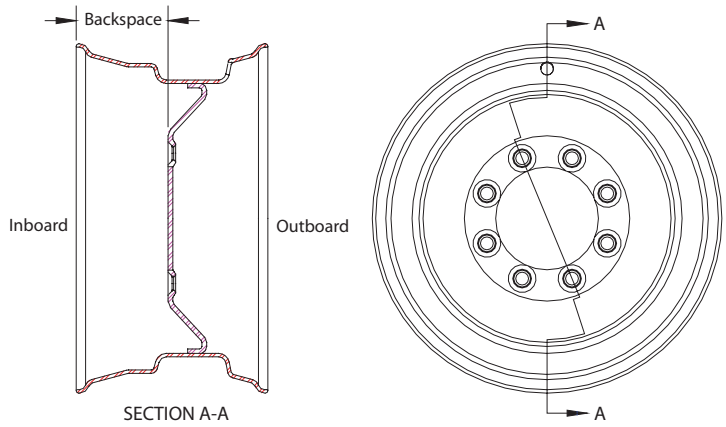
Tire Size		Fill Specification			Usage†					
		Fill Type	Ply Rating	Pressure (Factory) (kPa)	MID SIZE		FULL SIZE			
					7127	7135	8831	8841	9241	9250
#6A	10-16.5 CARLISLE US LOADER	Air	10	517.1*	S	S	S	S	N/A	N/A
#6A	10-16.5 OTR OUTRIGGER (Non-Marking)		10	517.1*	O	O	O	O	N/A	N/A
#7A	31-15.5-15 GOODYEAR TERRA XTRAC		8	310.3*	N/A	N/A	N/A	N/A	N/A	N/A
#6F	10-16.5 CARLISLE US LOADER	Foam	10	N/A	O	O	O	O	S	S
#6F	10-16.5 OTR OUTRIGGER (Non-Marking)		10	N/A	O	O	O	O	N/A	N/A
#7F	31-15.5-15 GOODYEAR TERRA XTRAC		8	N/A	O	O	O	O	N/A	N/A

60378AF-CE-R

* Factory preset @ 20°C. **Check pressures regularly as tires can lose pressure over time and over different ambient temperatures even under normal conditions.**

† Usage: (**S**)tandard Or (**O**)ptional
(**N/A**) Not Available

Rim Backspace Diagram



Rim Size	Backspace					
	7127	7135	8831	8841	9241	9250
#6 & #6F	95 mm	95 mm	121 mm	121 mm	95 mm	95 mm
#7 & #7F	All models are 135 mm				N/A	

60380AE-CE-R

Table 2.3c Tire Specifications - AS

WARNING

Air pressure can affect stability. Temperature changes can affect air pressure. It is important to visually inspect all tires for proper tire inflation prior to use. Tires should be checked by end user on a daily basis. Tire inflation pressures must be checked weekly with a calibrated gauge. If the measured pressure is less than the specification, reinflate to the pressure specified below. Tires must not be inflated above the recommended specification. Do not intermix tires of different types on one aerial platform. Use only tires of type originally supplied.

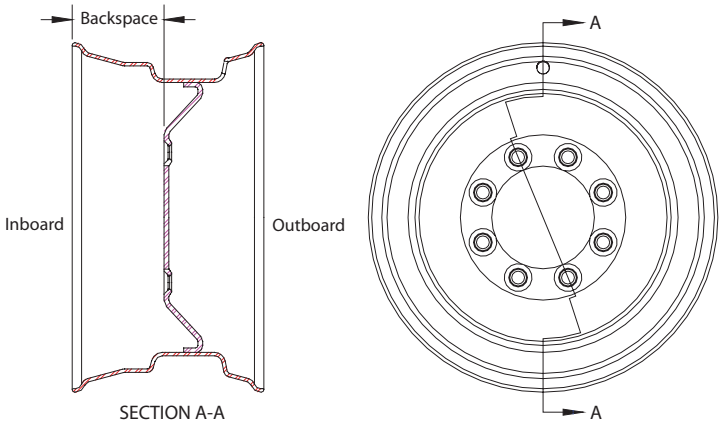
Tire Size		Fill Specification			Usage†						
		Fill Type	Ply Rating	Pressure (Factory)	MID SIZE				FULL SIZE		
				Psi (kPa)	7127	7135	8243	8850	8831	8841	9250
#6A	10-16.5 CARLISLE US LOADER	Air	10	75* (517.1)*	O	O	O	O	O	O	O
#6A	10-16.5 OTR OUTRIGGER (Non-Marking)		10	75* (517.1)*	O	O	O	O	O	O	O
#6F	10-16.5 CARLISLE US LOADER	Foam	10	N/A	S	S	S	S	S	S	S

60378AE-AS

- Factory preset @ 20°C, **Check pressures regularly as tires can lose pressure over time and over different ambient temperatures even under normal conditions.**

† Usage: (**S**)tandard Or (**O**)ptional
(N/A) Not Available

Rim Backspace Diagram



Rim Size	Backspace							
	7127		7135	8243	8850	8831	8841	9250
Serial Number	Contact Skyjack Service Department							
#6A & #6F	121mm	95 mm	95 mm	95 mm	95 mm	121mm	121mm	95 mm
	4.75 in.	3.75 in.	3.75 in.	3.75 in.	3.75 in.	4.75 in.	4.75 in.	3.75 in.

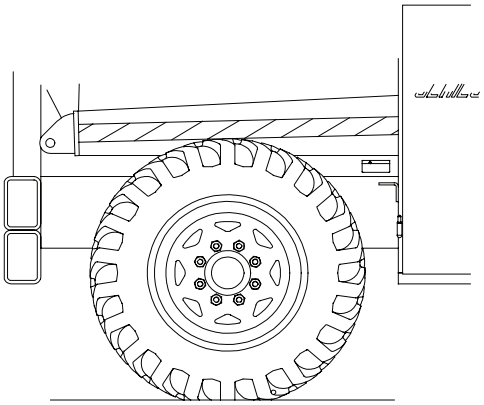
60380AE-AS

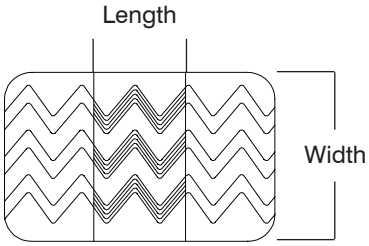
Floor Loading Pressure

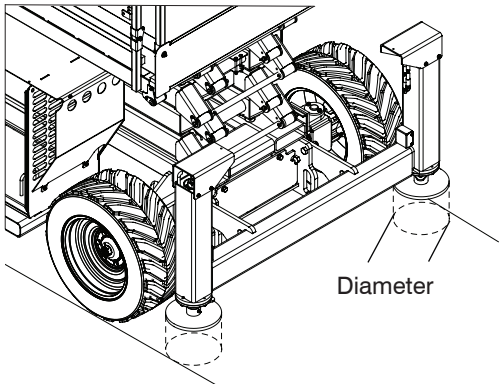
Locally Concentrated Pressure (LCP):

Foot Print Area = Length x Width
$= \pi r^2$

$$LCP = \frac{\text{Weight of Aerial Platform + Capacity}}{\text{Foot Print Area x 4 (Tires)}}$$



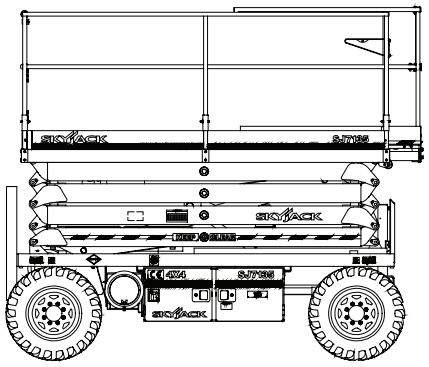


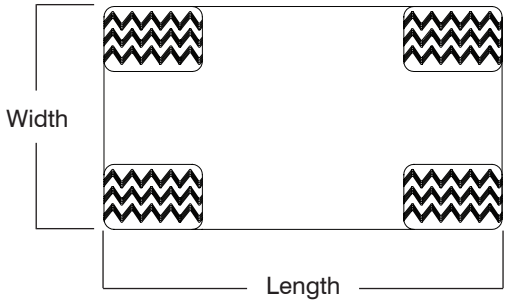


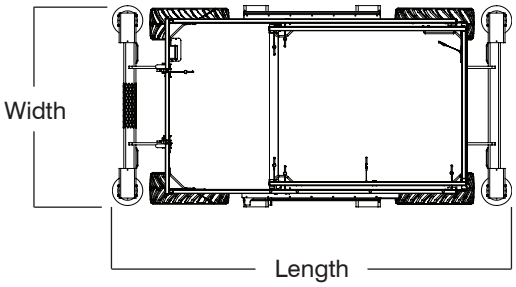
Overall Uniform Pressure (OUP):

Base Area = Length x Width

$$OUP = \frac{\text{Weight of Aerial Platform + Capacity}}{\text{Base Area}}$$







WARNING

Intermixing tires of different types or using tires of types other than those originally supplied with this equipment can adversely affect stability. Therefore, replace tires only with the exact original Skyjack-approved type. Failure to operate with matched approved tires in good condition may result in death or serious injury.

Table 2.4a Floor Loading Pressure - ANSI/CSA

MODEL		Total Aerial Platform Weight		Total Aerial Platform Load					
				WHEEL		LCP **		OUP **	
		lb.	kg	lb.	kg	psi	kPa	psf	kg/m^2
7127	min*	7920	3592	3168	1437	101.7	701.2	150.0	732.4
	max*	12180	5525	4872	2210	121.1	835.0	230.7	1126.4
7127 Outrigger Pads	min*	9360	4246	3744	1698	47.7	328.8	155.5	759.2
	max*	12180	5525	4872	2210	62.1	427.9	202.3	987.9
7135	min*	8850	4014	3540	1606	106.8	736.4	167.6	818.4
	max*	11980	5434	4792	2174	120.4	830.1	226.9	1107.9
7135 Outrigger Pads	min*	9790	4441	3916	1776	49.9	343.9	162.6	794.1
	max*	12110	5493	4844	2197	61.7	425.5	201.2	982.2
8243	min*	10600	4808	4240	1923	115.0	792.9	169.9	829.5
	max*	11980	5434	4792	2174	120.4	830.1	192.0	937.4
8243 Outrigger Pads	min*	10600	4808	4240	1923	54.0	372.4	176.1	859.8
	max*	12920	5860	5168	2344	65.8	453.9	214.6	1047.9
8850	min*	11460	5198	4584	2079	118.4	816.3	167.8	819.3
	max*	12530	5684	5012	2273	122.3	843.2	183.5	895.8
8850 Outrigger Pads	min*	11460	5198	4584	2079	58.4	402.6	196.2	958.2
	max*	12530	5684	5012	2273	63.8	440.2	214.6	1047.6
8831	min*	9670	4386	3868	1754	110.9	764.6	148.8	726.4
	max*	13350	6055	5340	2422	125.0	861.8	205.4	1002.9
8831 Outrigger Pads	min*	10540	4781	4216	1912	53.7	370.3	157.1	767.0
	max*	14300	6486	5720	2594	72.9	502.4	213.1	1040.6
8841	min*	10570	4794	4228	1918	114.9	792.2	162.6	794.0
	max*	13830	6273	5532	2509	126.4	871.5	212.8	1038.9
8841 Outrigger Pads	min*	11440	5189	4576	2076	58.3	401.9	170.5	832.5
	max*	14820	6722	5928	2689	75.5	520.7	220.9	1078.4
9250	min*	14700	6668	5880	2667	128.9	888.7	179.5	876.4
	max*	17470	7924	6988	3170	135.6	934.9	213.3	1041.5
9250 Outrigger Pads	min*	14700	6668	5880	2667	74.9	516.4	145.5	710.7
	max*	18410	8351	7364	3340	93.8	646.8	182.3	890.0

60379AE-ANSI-R

* **min** - Total aerial platform weight with no options
max - Aerial platform weight + all options + capacity

** **LCP** - **Locally Concentrated Pressure** is a measure of how hard the aerial platform presses on the areas in direct contact with the floor. The floor covering (tile, carpet, etc.) must be able to withstand more that the indicated values above.

OUP - **Overall Uniform Pressure** is a measure of the average load the aerial platform imparts on the whole surface directly underneath it. The structure of the operating surface (beams, etc.) must be able to withstand more than the indicated values above.

NOTE:

The **LCP** or **OUP** that an individual surface can withstand varies from structure to structure and is generally determined by the engineer or architect for that particular structure.

Table 2.4b Floor Loading Pressure - CE

MODEL		Total Aerial Platform Weight	Total Aerial Platform Load		
			WHEEL	LCP **	OUP **
		kg	kg	kPa	kg/m^2
7127	min*	3592	1437	701	732
	max*	5525	2210	835	1126
7127 Outrigger Pads	min*	4246	1698	329	759
	max*	5525	2210	428	988
7135	min*	4014	1606	736	818
	max*	5434	2174	830	1108
7135 Outrigger Pads	min*	4441	1776	344	794
	max*	5493	2197	426	982
8831	min*	4386	1754	765	726
	max*	6055	2422	862	1003
8831 Outrigger Pads	min*	4781	1912	370	767
	max*	6486	2594	502	1041
8841	min*	4794	1918	792	794
	max*	6273	2509	872	1039
8841 Outrigger Pads	min*	5189	2076	402	833
	max*	6722	2689	521	1078
9241	min*	6718	2687	1408	887
	max*	7448	2979	1495	893
9241 Outrigger Pads	min*	6718	2687	520	700
	max*	7448	2979	577	705
9250	min*	7407	2963	1490	969
	max*	8137	3255	1576	975
9250 Outrigger Pads	min*	7407	2963	573	765
	max*	8137	3255	630	770

60379AF-CE-R

* **min** - Total aerial platform weight with no options
max - Aerial platform weight + all options + capacity

** **LCP** - **Locally Concentrated Pressure** is a measure of how hard the aerial platform presses on the areas in direct contact with the floor. The floor covering (tile, carpet, etc.) must be able to withstand more that the indicated values above.

OUP - **Overall Uniform Pressure** is a measure of the average load the aerial platform imparts on the whole surface directly underneath it. The structure of the operating surface (beams, etc.) must be able to withstand more than the indicated values above.

NOTE:

The **LCP** or **OUP** that an individual surface can withstand varies from structure to structure and is generally determined by the engineer or architect for that particular structure.

Table 2.4c Floor Loading Pressure - AS

MODEL		Total Aerial Platform Weight	Total Aerial Platform Load		
			WHEEL	LCP **	OUP **
		kg	kg	kPa	kg/m^2
7127	min*	3592	1437	701.2	732.4
	max*	5525	2210	835.0	1126.4
7127 Outrigger Pads	min*	4246	1698	328.8	759.2
	max*	5525	2210	427.9	987.9
7135	min*	4014	1606	736.4	818.4
	max*	5434	2174	830.1	1107.9
7135 Outrigger Pads	min*	4441	1776	343.9	794.1
	max*	5493	2197	425.5	982.2
8243	min*	4808	1923	792.9	829.5
	max*	5434	2174	830.1	937.4
8243 Outrigger Pads	min*	4808	1923	372.4	859.8
	max*	5860	2344	453.9	1047.9
8850	min*	5198	2079	816.3	819.3
	max*	5684	2273	843.2	895.8
8850 Outrigger Pads	min*	5198	2079	402.6	958.2
	max*	5684	2273	440.2	1047.6
8831	min*	4386	1754	764.6	726.4
	max*	6055	2422	861.8	1002.9
8831 Outrigger Pads	min*	4781	1912	370.3	767.0
	max*	6486	2595	502.4	1040.6
8841	min*	4794	1918	792.2	794.0
	max*	6273	2509	871.5	1038.9
8841 Outrigger Pads	min*	5189	2076	401.9	832.5
	max*	6722	2689	520.7	1078.4
9250	min*	6668	2667	888.7	876.4
	max*	7924	3170	934.9	1041.5
9250 Outrigger Pads	min*	6668	2667	516.4	710.7
	max*	8351	3340	646.8	890.0

60379AE-AS

* **min** - Total aerial platform weight with no options (with air-filled tires)
max - Aerial platform weight + all options

** **LCP** - **Locally Concentrated Pressure** is a measure of how hard the aerial platform presses on the areas in direct contact with the floor. The floor covering (tile, carpet, etc.) must be able to withstand more that the indicated values above.

OUP - **Overall Uniform Pressure** is a measure of the average load the aerial platform imparts on the whole surface directly underneath it. The structure of the operating surface (beams, etc.) must be able to withstand more than the indicated values above.

NOTE:

The **LCP** or **OUP** that an individual surface can withstand varies from structure to structure and is generally determined by the engineer or architect for that particular structure.

Table 2.5 Rough Terrain Scissor Fluids

AXLE OIL					
Axle Type		*Qty. (Liters)	*Qty. (Gallons)	Oil Type	Recommended Equivalent Oil
Cushman	Front	2.4	0.634	Gear Oil, 80W-90 GL5	-
Dana	Front / Rear				
Cushman	Rear	1	0.264	Gear Oil, ESI 80W-90	Chevron Gear Lubricant Delo ESI 80W-90, Caltex Gear Lubricant ESI 80W-90, Caltex RPM Borate EP 80W-90, Texaco Star Gear Lubricant 80W-90

*All fuel capacity quantities are in standard liter or US gallons (liquid).

**Use distilled water and 50/50 mix of anti-freeze/water.

CENTER DRIVE OIL				
Center Drive Type	*Qty. (Liters)	*Qty. (Gallons)	Oil Type	Recommended Equivalent Oil
Center Drive	1	0.26	Gear Oil, 80W-90 GL5	-

*All fuel capacity quantities are in standard liter or US gallons (liquid).

**Use distilled water and 50/50 mix of anti-freeze/water.

HYDRAULIC OIL			
Model	*Qty. (Liters)	*Qty. (Gallons)	Oil Type
SJRT-68XX	86.88	22.95	ATF Dexron III
SJRT-7127	80.48	21.26	
SJRT-7135			
SJRT-8243			
SJRT-8850			
SJRT-8831	75.71	20	
SJRT-8841			
SJRT-8831E			
SJRT-8841E			
SJRT-9241	67.38	17.8	
SJRT-9250			

*All fuel capacity quantities are in standard liter or US gallons (liquid).

**Use distilled water and 50/50 mix of anti-freeze/water.

Table 2.5 Rough Terrain Scissor Fluids (Continued)

ENGINE OIL				
Engine Type	*Qty. (Liters)	*Qty. (Gallons)	Oil Type, Viscosity	Recommended Equivalent Oil (Viscosity - API Service Designation)
Kubota D902	3.9	1.03	Engine Oil, SAE 10W-30	10W30 - API Service Designation CG-4, CF-4, CF, CD, SH.
Kubota D1105	5.1	1.35		
Kubota DF972	3.4	0.9		
Nissan A15	3.5	0.98		
GM 1.6				10W30 - API Service Designation SF/CC.

*All fuel capacity quantities are in standard liter or US gallons (liquid).

**Use distilled water and 50/50 mix of anti-freeze/water.

ENGINE COOLANT			
Component Type	*Qty. (Liters)	*Qty. (Gallons)	**Coolant Type
Kubota D902	3.1	0.82	Anti-freeze / Water
Kubota D1105			
Kubota DF972			
Nissan A15	11.4	3.01	
GM 1.6			Extended life anti-freeze / Water

*All fuel capacity quantities are in standard liter or US gallons (liquid).

**Use distilled water and 50/50 mix of anti-freeze/water.

ENGINE FUEL							
Model	Tank		Diesel		Gasoline / Liquid Propane		
	*Qty. (Liters)	*Qty. (Gallons)	Kubota D902	Kubtoa D1105	Kubota DF972	GM 1.6	Nissan A15
SJRT-68xx	86.88	22.95	✓	N/A	✓	N/A	
SJRT-7127	80.48	21.26	N/A	✓			
SJRT-7135							
SJRT-8243					N/A	✓	
SJRT-8850							
SJRT-8831	49.21	13					
SJRT-8841							
SJRT-9241	64.35	17					
SJRT-9250							

*All fuel capacity quantities are in standard liter or US gallons (liquid).

**Use distilled water and 50/50 mix of anti-freeze/water.

Table 2.6 Torque Specifications

Directional valve mounting bolts	28-32 lbf.in	3.16 - 3.61 Nm
Wheel mounting bolts	135-145 lbf.ft	183 – 196 Nm
Center drive sprocket mounting bolts	110-115 lbf.ft (242 LOCTITE)	149 – 156 Nm
Hydraulic drive motor mounting bolts	120 lbf.ft (242 LOCTITE)	162 Nm
Positive battery post cable/fuse nut	90 lb-in	10.2 Nm

Cartridge

Torque	Size					
	08	38	58	10	12	16
Lbf.ft (max)	20			25	35	50
Lbf.in (max)	240			300	420	600
Nm (max)	27.12			33.90	47.46	67.80

Coils

Torque	Size
	All coils
Lbf.ft (max)	4 to 5
Lbf.in (max)	48 to 60
Nm (max)	5.42 to 6.78

SAE Plugs

Torque	Size							
	2	4	5	6	8	10	12	16
Lbf.ft (max)	3	10	15		25		30	35
Lbf.in (max)	36	120	180		300		360	420
Nm (max)	4.07	13.56	20.34		33.90		40.68	47.46

Newton-meter = Nm | **Pound-force foot = lbf.ft** | **Pound-force inch = lbf.in**

60022AC

Section 3
SYSTEM COMPONENT IDENTIFICATION AND SCHEMATICS

Table of Contents

Charts

3.1 Hydraulic Symbol Chart....3
3.2 Electrical Symbol Chart....4

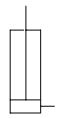
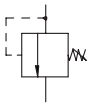
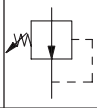
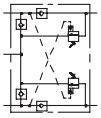
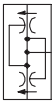
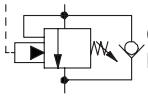
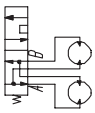
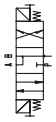
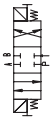
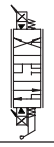
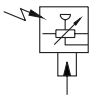
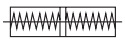
Parts List

3.3 Hydraulic Component Parts List....5
3.4 Electrical Component Parts List....8

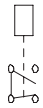
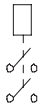
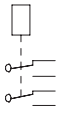
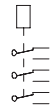
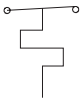
Diagrams and Schematics

3.5 Platform Control Console Wiring - All Options (ANSI/CSA)....15
3.6 Platform Control Console Wiring - All Options (CE)....16
3.7 Control Cable Assemblies Diagram....17
3.8 Outrigger & Hydraulic Generator Control Console Wiring....18
3.9 Base Control Console Wiring (ANSI/CSA)....19
3.10 Base Control Console Wiring (CE)....20
3.11 Hydraulic Schematic (Cushman Axles) (Model 9241)....21
3.12 Hydraulic Schematic (Cushman Axles) (Model 9250)....22
3.13 Hydraulic Schematic (Dana Axles)....23
3.14 Hydraulic Manifold Components & Port Identifications....24
3.15 Main Manifold Wiring Diagram....25
3.16 Oil Cooler - Electrical Panel Diagram (ANSI/CSA Dual Fuel Engine)....26
3.17 Hydraulic Generator - Electrical Panel Diagram (ANSI/CSA Dual Fuel Engine)....27
3.18 Hydraulic Generator - Electrical Panel Diagram (ANSI/CSA Diesel Engine)....28
3.19 Hydraulic Generator - Electrical Panel Diagram (CE)....29
3.20 Emergency Lowering System - Wiring Diagram (ANSI/CSA) (Model 9250)....30
3.21 Emergency Lowering System - Wiring Diagram (CE) (Model 9250)....31
3.22 Emergency Lowering System - Electrical Wiring Diagram (CE) (Model 9241)....32
3.23 AutoLeveling Outrigger Connection Diagram....33
3.24 Powered Extension Platform - Electrical Wiring Diagram (Model 9250)....34
3.25 Horn, Light & Beeper Wiring Diagram (ANSI/CSA) (Model 9250)....35
3.26 Horn, Light, Beeper & Load Sensing Wiring Diagram....36
3.27 Electrical Inverter Wiring Diagram....37
3.28 Engine Wiring Diagram - Kubota Diesel Engine....39
3.29 Engine Harnesses - GM Dual Fuel Engine....40
3.30 Electrical Panel Diagram - ANSI/CSA (All Option)....41
3.31 Electrical Panel Diagram - CE (All Option)....42
3.32 Electrical Schematic - ANSI/CSA & AS (All Option with Kubota Diesel Engine)....43
3.33 Electrical Schematic - CE (All Option with Kubota Diesel Engine)....44
3.34 Electrical Schematic - ANSI/CSA & AS (All Options with GM Dual Fuel Engine)....45
3.35 Electrical Schematic - ANSI/CSA & AS (No Options with GM Dual Fuel Engine)....46
3.36 Interface & Engine Electrical Schematic - GM Dual Fuel Engine....47

3.1 Hydraulic Symbol Chart

LINE CROSSING	VARIABLE DISPLACEMENT PUMP	SHUTTLE VALV	VELOCITY FUSE
LINE JOINED	HAND PUMP	ACCUMULATOR, GAS CHARGED	 SINGLE ACTING CYLINDER
HYDRAULIC TANK	 RELIEF VALVE	CUSHION CYLINDER	DOUBLE ACTING CYLINDER
HYDRAULIC FILTER WITH BYPASS	 PRESSURE REDUCING VALVE	PRESSURE SWITCH	DOUBLE ACTING DOUBLE RODDED
ELECTRIC MOTOR	FIXED ORIFICE	 MOTION CONTROL VALVE	SPRING APPLIED HYDRAULIC RELEASED BRAKE
ENGINE	ADJUSTABLE FLOW CONTROL	 FLOW DIVIDER COMBINER	BRAKE CYLINDER
FIXED DISPLACEMENT PUMP	CHECK VALVE	 COUNTER BALANCE VALVE	ROTARY ACTUATOR
THREE POSITION FOUR WAY PROPORTIONAL	OIL COOLER	VALVE COIL	BI DIRECTIONAL HYDRAULIC MOTOR
 SERIES PARALLEL HYDRAULIC MOTOR	TWO POSITION TWO WAY NORMALLY CLOSED	TWO POSITION THREE WAY	 THREE POSITION FOUR WAY CLOSED CENTER OPEN PORT
TWO POSITION TWO WAY NORMALLY OPEN	TWO POSITION THREE WAY	 THREE POSITION FOUR WAY CLOSED CENTER CLOSED PORT	 THREE POSITION FOUR WAY PROPORTIONAL
 PRESSURE TRANSDUCER	MAIN LINES S	PILOT LINES D	VARIABLE DISPLACEMENT HYDRAULIC MOTOR
 SERVO	UICK DISCONNECT		

3.2 Electrical Symbol Chart

WIRE CROSSING	HOURMETER	KEY SWITCH	ANGLE TRANSDUCER
WIRES JOINED	LIGHT	FOOT SWITCH	PRESSURE TRANSDUCER
BATTERY	HYDRAULIC VALVE COIL	TOGGLE SWITCH	LIMIT SWITCH N.O.
GROUND	PROPORTIONAL HYDRAULIC VALVE COIL	PUSH BUTTON	LIMIT SWITCH N.O. HELD CLOSED
FUSE	ELECTRIC MOTOR	ROTARY SWITCH	LIMIT SWITCH N.C.
CIRCUIT BREAKER	HORN	LIMIT SWITCH	LIMIT SWITCH N.C. HELD OPEN
BATTERY CHARGE INDICATOR	EMERGENCY STOP BUTTON	CAM OPERATED LIMIT SWITCH	SILICON CONTROLLED RECTIFIER
CAPACITOR	RESISTOR	TILT SWITCH	PROXIMITY SWITCH
POTENTIOMETER	LEVEL SENSOR	SINGLE POLE SINGLE THROWN RELAY	PNP TRANSISTOR
 SINGLE POLE DOUBLE THROW RELAY	 DOUBLE POLE SINGLE THROW RELAY	 DOUBLE POLE DOUBLE THROW RELAY	NPN TRANSISTOR
 TRIPLE POLE DOUBLE THROW RELAY	DIODE	TRANSISTOR	PRESSURE/ VACUUM SWITCH
 TEMPERATURE SWITCH			

3.3 Hydraulic Component Parts List

Index No.	Skyjack Part No.	Qty.	Description
2H-13A	103655	1	VALVE, Main lowering
2H-13A-1	107269	1	VALVE, Lift cylinder holding **(Model 9241)**
	103655	1	VALVE, Lift cylinder holding **(Model 9250)**
2H-13A-2	107269	1	VALVE, Lift cylinder holding **(Model 9241)**
	103655	1	VALVE, Lift cylinder holding **(Model 9250)**
2H-13A-3	103655	1	VALVE, Lift cylinder holding **(Model 9250)**
2H-13A-4	103655	1	VALVE, Lift cylinder holding **(Model 9250)**
2H-14B	103655	1	VALVE, Lift
2H-17A	114365	1	VALVE, Large pump dump
2H-17B	103655	1	VALVE, Outrigger holding
2H-18A	103656	1	VALVE, Small pump dump
2H-25	102626	1	VALVE, Quick brake
2H-30A	112218	1	VALVE, Free-wheeling
2H-30A-1	103656	1	VALVE, Brake dump
2H-30A-2	103655	1	VALVE, Brake feed
2H-86C	104412	1	VALVE, Hydraulic generator (option)
2H-98-1	103655	1	VALVE, Auxiliary lowering **(Model 9250)**
2H-98-2	103655	1	VALVE, Auxiliary lowering **(Model 9250)**
2H-98-3	103655	1	VALVE, Auxiliary lowering **(Model 9250)**
2H-98-4	103655	1	VALVE, Auxiliary lowering **(Model 9250)**
3H-20A	103623	1	VALVE, Series/parallel
4H-15B	139256	1	VALVE, Reverse drive (includes 4H-16B)
4H-16B	139256	1	VALVE, Forward drive (includes 4H-15B)
4H-23A	128318	1	VALVE, Right steer (includes 4H-24A)
4H-24A	128318	1	VALVE, Left steer (includes 4H-23A)
4H-26	128318	1	VALVE ASSEMBLY, Front platform extend (option) (includes 4H-27A)
4H-26A	128318	1	VALVE ASSEMBLY, Rear platform extend (option) (includes 4H-27)
4H-27	128318	1	VALVE ASSEMBLY, Front platform retract (option) (includes 4H-26A)
4H-27A	128318	1	VALVE ASSEMBLY, Rear platform retract (option) (includes 4H-26)
4H-71	128318	1	VALVE ASSEMBLY, Left front outrigger retract (includes 4H-75)
4H-72	128318	1	VALVE ASSEMBLY, Right front outrigger retract (includes 4H-76)
4H-73	128318	1	VALVE ASSEMBLY, Right rear outrigger retract (includes 4H-77)
4H-74	128318	1	VALVE ASSEMBLY, Left rear outrigger retract (includes 4H-78)
4H-75	128318	1	VALVE ASSEMBLY, Left front outrigger extend (includes 4H-71)
4H-76	128318	1	VALVE ASSEMBLY, Right front outrigger extend (includes 4H-72)
4H-77	128318	1	VALVE ASSEMBLY, Right rear outrigger extend (includes 4H-73)
4H-78	128318	1	VALVE ASSEMBLY, Left rear outrigger extend (includes 4H-74)
BP1	133441	1	BRAKE PACK (alternate) (Cushman axles)
C1	120349	1	CYLINDER, Lift **(Model 9241)**
	120353	1	CYLINDER, Lift **(Model 9250)**
C2	120349	1	CYLINDER, Lift **(Model 9241)**
	120353	1	CYLINDER, Lift **(Model 9250)**
C3	120353	1	CYLINDER, Lift **(Model 9250)**
C4	120353	1	CYLINDER, Lift **(Model 9250)**
C5	120422	1	CYLINDER, Brake
C6	120422	1	CYLINDER, Brake

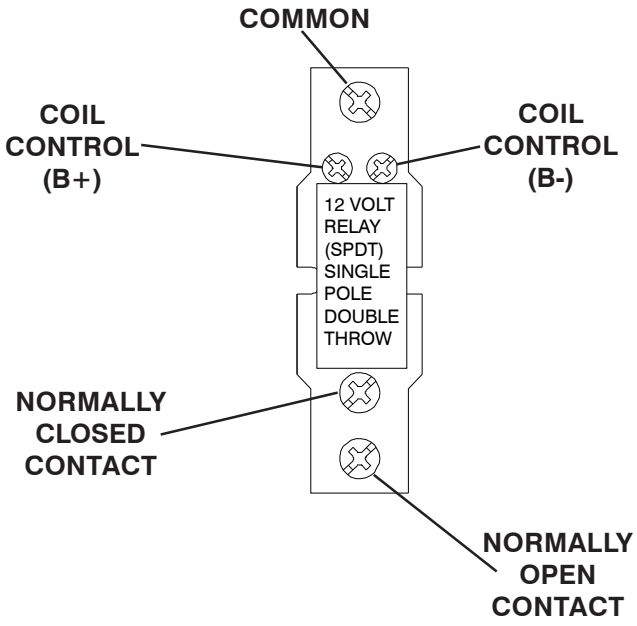
Parts list continued on the following page.

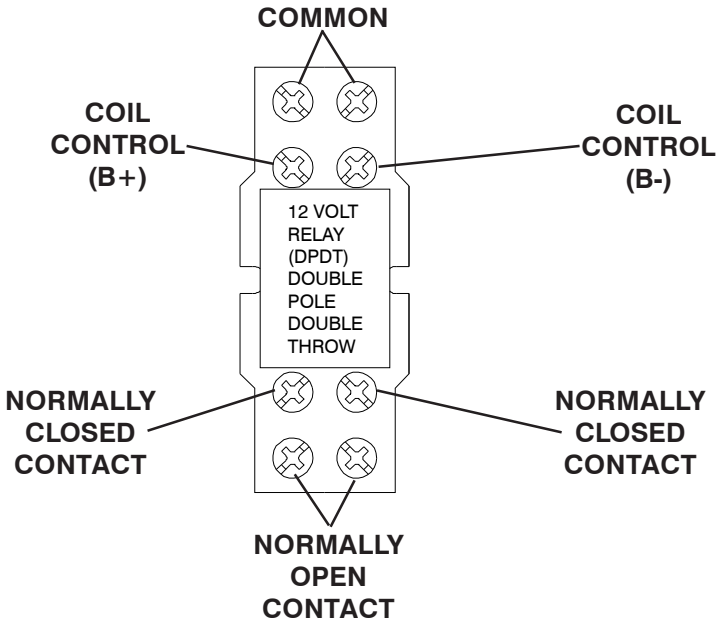
3.3 Hydraulic Component Parts List (Continued)

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
C7	120405	1	CYLINDER, Steer (Dana axles)
	133474	1	CYLINDER, Steer (Cushman axles)
C8	107752	1	CYLINDER, Cushion
C9	132694	1	CYLINDER, Front Left outrigger
C10	132694	1	CYLINDER, Front Right outrigger
C11	132694	1	CYLINDER, Rear Right outrigger
C12	132694	1	CYLINDER, Rear Left outrigger
C13	120255	1	CYLINDER, Front extension platform
C14	120255	1	CYLINDER, Rear extension platform
CBV1	132249	1	COUNTER BALANCE VALVE, Motion control
CBV2	132249	1	COUNTER BALANCE VALVE, Motion control
CV1	104624	1	CHECK VALVE, Small pump
CV2	104624	1	CHECK VALVE, Large pump
CV3	104624	1	CHECK VALVE, Lift
CV4	104415	1	CHECK VALVE, Left front outrigger
CV5	104415	1	CHECK VALVE, Right front outrigger
CV6	104415	1	CHECK VALVE, Right rear outrigger
CV7	104415	1	CHECK VALVE, Left rear outrigger
CV11	132248	1	CHECK VALVE, Motion control
CV12	132248	1	CHECK VALVE, Motion control
CV13	132248	1	CHECK VALVE, Motion control
CV14	132248	1	CHECK VALVE, Motion control
DCMI	300248		DC MOTOR, 12V
F1	109568	1	FILTER ASSEMBLY, Return
	104254	1	• ELEMENT, Filter
GM1	113875	1	GENERATOR MOTOR, Hydraulic (option)
HP2	110652	1	PUMP, Cavity hand (Cushman axles)
M1	109311	1	MOTOR, Main 2-Speed hydraulic drive
MB1	114178	1	MANIFOLD BLOCK, Main
MB2	103137	1	MANIFOLD BLOCK, Emergency lowering
MB3	130443	1	MANIFOLD BLOCK, Holding valve **(Model 9241)**
	118345	1	MANIFOLD BLOCK, Holding valve **(ANSI/CSA, Model 9250)**
	130444	1	MANIFOLD BLOCK, Holding valve **(CE, Model 9250)**
MB4	106688	1	MANIFOLD BLOCK, Holding valve **(Model 9241)**
	118345	1	MANIFOLD BLOCK, Holding valve **(Model 9250)**
MB5	118345	1	MANIFOLD BLOCK, Holding valve **(Model 9250)**
MB6	118345	1	MANIFOLD BLOCK, Holding valve **(Model 9250)**
MB7	125430	1	MANIFOLD BLOCK, Lower lift line
MB8	125430	1	MANIFOLD BLOCK, Upper lift line **(Model 9250)**
MB9	113494	1	MANIFOLD BLOCK, Controlled lowering
MB5	118345	1	MANIFOLD BLOCK, Holding valve **(Model 9250)**
MB6	118345	1	MANIFOLD BLOCK, Holding valve **(Model 9250)**
MB7	125430	1	MANIFOLD BLOCK, Lower lift line
MB8	125430	1	MANIFOLD BLOCK, Upper lift line **(Model 9250)**
			Parts list continued on the following page.

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
MB9	113494	1	MANIFOLD BLOCK, Controlled lowering
MB10	111943	1	MANIFOLD BLOCK, Disc brake (Cushman axles)
MB11	111970	1	MANIFOLD BLOCK, Outrigger
MB12	103137	1	MANIFOLD BLOCK, Hydraulic generator valve (option)
MB13	111291	1	MANIFOLD BLOCK, Front powered platform
MB14	111291	1	MANIFOLD BLOCK, Rear powered platform
MB15	103615	1	MANIFOLD BLOCK, Free-wheeling valve
MB16	132261	1	MANIFOLD BLOCK, Motion control
MC1	132244	1	MOTION CONTROL ASSEMBLY
O1	131927	1	ORIFICE, Main (.096 diameter) **(Model 9250)**
O2	105501	4	ORIFICE, Lift cylinder (Ø 0.094)
O5	108721	1	ORIFICE, Controlled lowering (Ø 0.055)
O7	125244	1	ORIFICE, Lift line (Ø 0.120") **(Model 9241)**
OC1	114284	1	OIL COOLER, Hydraulic generator (option)
P1	110460	1	PUMP, Hydraulic dual (0.488/0.854)
P3	113173	1	PUMP, Power platform
PS1	102863	1	PRESSURE SWITCH (option) (trips at 2400 psi)
PT1	134432	1	TRANSDUCER, Pressure
QD1	122419	1	QUICK DISCONNECT, System pressure
R1	104534	1	RELIEF VALVE, System
R2	104534	1	RELIEF VALVE, Lift
R3	106557	1	RELIEF VALVE, Lift cylinder **(Model 9241)**
	104534	1	RELIEF VALVE, Cylinder **(Model 9250)**
R4	106557	1	RELIEF VALVE, Lift cylinder **(Model 9241)**
	104534	1	RELIEF VALVE, Cylinder **(Model 9250)**
R5	104534	1	RELIEF VALVE, Cylinder **(Model 9250)**
R6	104534	1	RELIEF VALVE, Cylinder **(Model 9250)**
R8	113286	1	RELIEF VALVE, Power platform (Set at 500psi)
V1	107271	1	VALVE, Emergency lowering
V2	113556	1	VALVE, Controlled lowering
V6	113752	1	VALVE, Auto reset (Cushman axles)

RELAY DIAGRAM





Index No.	Skyjack Part No.	Qty.	Description
1TD	103207	1	RELAY, Drive Time Delay (DPDT)
2D37	147131	1	SOLENOID, Stop (Diesel Engines)
9CR2	127131	1	RELAY, Outrigger enable
9CR3	127131	1	RELAY, Outrigger enable proof
9BCR	111787	1	CONTACTOR, Powered Extension 12 Volt **(CE)**
9CR1	111787	1	CONTACTOR, 12 Volt (powered extension platform option)
10ACR1	103207	1	RELAY, Engine run
10ACR2	127035	1	RELAY, 12 Volt DPDT (Hydraulic generator/oil cooler)
10BCR1	103316	1	RELAY, Engine On (SPDT) **(ANSI/CSA)**
	103207	1	RELAY, Engine On (DPDT) **(CE)**
12BCR	127035	1	RELAY, Joystick Enable Switch
13CR	103316	1	RELAY, Down (SPDT) **(ANSI/CSA)**
13DCR	103316	1	RELAY, Down (down) **(CE)**
14CR	103316	1	RELAY, Up (SPDT) **(ANSI/CSA)**
14DCR	103316	1	RELAY, Up **(CE)**
15CR	103316	1	RELAY, Reverse Drive (DPDT)
16CR	103316	1	RELAY, Forward Drive (DPDT)
17CR	103316	1	RELAY, 2nd Speed/Large pump (SPDT)
17ACR	103316	1	RELAY, Small Pump (SPDT)
17DCR	127131	1	RELAY, Outrigger lift disable
18CR	103316	1	RELAY, 3rd Speed (SPDT)
20CR	103316	1	RELAY, Series/Parallel (SPDT)
23CR	103316	1	RELAY, Right Steer (SPDT)
24CR	103316	1	RELAY, Left Steer (SPDT)
28CR	103207	1	RELAY, Tilt Switch (DPDT)
28CR1	103207	1	RELAY, Tilt (CE)
28CR2	103316	1	RELAY, Down enable (CE)
28ECR1	103207	1	RELAY, Auxiliary tilt (CE)
28ECR2	103316	1	RELAY, Auxiliary down enable (CE)
30CR	103316	1	RELAY, Brake (SPDT)
31CR	103316	1	RELAY, Choke/Glow Plug (SPDT)
31ACR	127035	1	RELAY, Kubota Diesel Engine Glow Plug
32CR	103207	1	RELAY, Engine Start (DPDT)
32ACR	147125	1	SOLENOID, Engine starter (Kubota Diesel)
	142308	1	RELAY, 12V 40A, Starter (GM)
34BCR	103316	1	RELAY, Low/High Throttle (SPDT)
35CR	103207	1	RELAY, Tilt override (DPDT)
49CR	103316	1	RELAY, Horn (SPDT)
56CR	143805	1	RELAY, 12V 20A/35A, Fuel pump (GM)
61CR	127131	1	RELAY, Outrigger Drive Enable
65CR	127131	1	RELAY, Outrigger lift enable (SPDT)
86ACR	103316	1	RELAY, 12 Volt SPDT (hydraulic generator)
86BCR	103207	1	RELAY, 12 Volt DPDT (hydraulic generator stop)
97ACR-1	103207	1	CONTACTOR, Powered Extension Platform **(CE)**
97ACR-2	111787	1	RELAY, Powered Extension Platform **(CE)**
99CR	300242	1	SOLENOID, Powered Extension Platform Motor
2002CR	143805	1	RELAY, 20A/35A 12V, Power

Parts list continued on the following page.

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
2H-13A	103613	1	COIL, Main Lowering Valve
2H-13A-1	104410	1	COIL, Lift Cylinder Holding Valve **(ANSI/CSA)**
2H-13A-2	104410	1	COIL, Lift Cylinder Holding Valve
2H-13A-3	104410	1	COIL, Lift Cylinder Holding Valve
2H-13A-4	104410	1	COIL, Lift Cylinder Holding Valve **(Model 9250)**
2H-13A-5	104410	1	COIL, Lift Cylinder Holding Valve **(CE, Model 9250)**
2H-14B	103613	1	COIL, Lift Valve
2H-17A	106272	1	COIL, Large Pump Dump Valve
2H-17B	103613	1	COIL, Outrigger Holding Valve
2H-18A	103613	1	COIL, Small Pump Dump Valve
2H-25	103613	1	COIL, 12 Volt brake valve
2H-30A	103613	1	COIL, Free-wheeling Valve
2H-30A-1	103613	1	COIL, Brake Dump Valve
2H-30A-2	103613	1	COIL, Brake Feed Valve
2H-86C	106272	1	COIL, Hydraulic generator option valve
2H-98-1	104410	1	COIL, Lift Cylinder Auxiliary Holding Valve **(Model 9250)**
2H-98-2	104410	1	COIL, Lift Cylinder Auxiliary Holding Valve **(Model 9250)**
2H-98-3	104410	1	COIL, Lift Cylinder Auxiliary Holding Valve **(Model 9250)**
2H-98-4	104410	1	COIL, Lift Cylinder Auxiliary Holding Valve **(Model 9250)**
2P-56	142324	1	SOLENOID, Propane lockoff valve (GM Dual Fuel Engine)
3H-20A	103613	1	COIL, Series/Parallel Drive Valve
4H-15B	128321	1	COIL, Reverse Drive Valve
4H-16B	128321	1	COIL, Forward Drive Valve
4H-23A	128321	1	COIL, Right Steer Valve
4H-24A	128321	1	COIL, Left Steer Valve
4H-26	128321	1	COIL, Front Powered Extension Extend - 12 Volt (Includes 4H-27)
4H-26A	128321	1	COIL, Rear Powered Extension Extend - 12 Volt (Includes 4H-27A)
4H-27	128321	1	COIL, Front Powered Extension Retract - 12 Volt (Includes 4H-26)
4H-27A	128321	1	COIL, Rear Powered Extension Retract - 12 Volt (Includes 4H-26A)
4H-71	128321	1	COIL, 12 Volt front left outrigger up
4H-72	128321	1	COIL, 12 Volt front right outrigger up
4H-73	128321	1	COIL, 12 Volt rear right outrigger up
4H-74	128321	1	COIL, 12 Volt rear left outrigger up
4H-75	128321	1	COIL, 12 Volt front left outrigger down
4H-76	128321	1	COIL, 12 Volt front right outrigger down
4H-77	128321	1	COIL, 12 Volt rear right outrigger down
4H-78	128321	1	COIL, 12 Volt rear left outrigger down
AT1	130440	1	TRANSDUCER, Angle **(CE)**
B1	103295	1	BATTERY, 12 Volt (starting)
B2	108789	1	BATTERY, 12 Volt (auxiliary)
BP-29	103056	1	BEEPER (7.5 - 16 VDC) **(ANSI/CSA)**
			Parts list continued on the following page.

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
	117967	1	BEEPER (XL-600 9-28 VDC) **(CE)**
CAP1	103319	1	CAPACITOR, 50 Volt, 1000MFD
CAP2	103319	1	CAPACITOR, 50 Volt, 1000MFD **(CE)**
CB1	117326	1	CIRCUIT BREAKER, 20 Amp
CB3	117326	1	CIRCUIT BREAKER, 20 Amp
CB4	117326	1	CIRCUIT BREAKER, 20 Amp (hydraulic generator option)
CEL1	133133	1	LIGHT, Check engine (GM)
CM1	130439	1	MODULE, Load sensing control **(CE)**
CPS1	143530	1	SENSOR, Crankshaft position (GM)
CRD1	115283	1	CABLE ASSEMBLY, 32 pin control console
CRD2	115280	1	CABLE ASSEMBLY, 32 pin scissor control **(Model 9250)**
	148300	1	CABLE ASSEMBLY, 32 pin scissor control **(Model 9241)**
CRD3	134417	1	CABLE ASSEMBLY, 32 pin electrical panel
DA1	127688	1	DIODE ASSEMBLY (with 1 diode) (D28A) **(ANSI/CSA)**
DA2	129434	1	DIODE ASSEMBLY (with 1 diode) (D30A)
DA3	127684	1	DIODE ASSEMBLY (with 1 diode) (D44) **(ANSI/CSA)**
DA4	129284	1	DIODE ASSEMBLY (with 1 diode) (D10E) **(CE)**
DA5	134304	1	DIODE ASSEMBLY (with 1 diode) (D20A) **(CE)**
DA6	127685	1	DIODE ASSEMBLY (with 1 diode) (D86C-1) **(Hydraulic generator option CE)**
DA7	127926	1	DIODE ASSEMBLY (with 1 diode) (D86C-2) **(Hydraulic generator option CE)**
DA8	129303	1	DIODE ASSEMBLY (with 1 diode) (D14B-2) **(Hydraulic generator option CE)**
DA9	132807	1	DIODE ASSEMBLY (with 2 diodes) (D17A, D18A)
DA10	129213	1	DIODE ASSEMBLY (with 2 diodes) (D15A, D16A) **(ANSI/CSA)**
DA11	105657	1	DIODE ASSEMBLY (with 2 diodes) (D15A-2, D16A-2) **(CE)**
DA12	104313	1	DIODE ASSEMBLY (with 4 diodes) (D15A-1, D16A-1, D23A, D24A) **(ANSI/CSA)**
DA13	134305	1	DIODE ASSEMBLY (with 4 diodes) (D15A-1, D16A-1, D23A, D24A) **(CE)**
D02-XX	700166	AR	DIODE, Small
DXX	102921	AR	DIODE, Common
DCM1	300248	1	MOTOR, Powered Extension Platform 12 Volt
ECU1	146085	1	UNIT, Emission Control (GM)
EGP1	KUBOTA	1	PLUG, Engine glow (Diesel Fuel Engines)
F2	111282	1	FUSE, Powered Extension Platform (100 Amp)
F4	119469	1	FUSE, Inverter Option (200 Amp)
F5	120658	1	FUSE, Powered Extension Electrical Panel (10 Amp)
F6	121504	1	FUSE, 20 Amp (Dual Fuel Engines)
F7	143806	1	FUSE, 5 Amp, VSW (GM)
F8	143809	1	FUSE, 20 Amp, ECM (GM)
F9	143808	1	FUSE, 15 Amp, Fuel pump (GM)
F10	143807	1	FUSE, 10 Amp, EPR (GM)
F11	143808	1	FUSE, 15 Amp, Fuel pump (GM)
F12	143808	1	FUSE, 15 Amp, Starter (GM)
F13	143810	1	FUSE, 60 Amp, Alternator (GM)
			Parts list continued on the following page.

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
FAN	115384	1	FAN, Oil cooler
FL-22	126677	1	FLASHING LIGHT, 12 Volt
FL-29	103743	1	FLASHER
FP	142302	1	PUMP, Fuel (GM)
G	142309	1	ALTERNATOR (Dual Fuel Engines)
	137138	1	ALTERNATOR (Diesel Fuel Engines)
GPL1	132884	1	LIGHT, Glow Plug Indicator (Diesel Fuel Engines)
GPT1	132883	1	TIMER, Glow Plug (Diesel Fuel Engines)
H1	146652	1	HORN, 12 Volt
HTS-34A	106370	1	SOLENOID, High Throttle (Diesel Fuel Engines)
IGC1	143527	1	COIL, Ignition (GM)
INV1	124047	1	INVERTER, 1500 WATT (110/220V) **(CE)**
	123629	1	INVERTER, 1500 WATT **(ANSI/SIA & CSA)**
LED1	147229	1	POWER INDICATOR LIGHT (Platform control console)
LED2	147229	1	POWER INDICATOR LIGHT (Base control console)
LED3	147229	1	POWER INDICATOR LIGHT (Platform control console)
LS1	119375	1	LIMIT SWITCH, 26 Ft. lift Cut-out
LS4	115658	1	LIMIT SWITCH, End-of-stroke
LS5	119296	1	LIMIT SWITCH, Elevation/High Speed Cut-out
LS61	115658	1	LIMIT SWITCH, Outrigger Left Front Up
LS62	115658	1	LIMIT SWITCH, Outrigger Right Front Up
LS63	115658	1	LIMIT SWITCH, Outrigger Right Rear Up
LS64	115658	1	LIMIT SWITCH, Outrigger Left Rear Up
LS65	115658	1	LIMIT SWITCH, Outrigger Left Front Down
LS66	115658	1	LIMIT SWITCH, Outrigger Right Front Down
LS67	115658	1	LIMIT SWITCH, Outrigger Right Rear Down
LS68	115658	1	LIMIT SWITCH, Outrigger Left Rear Down
M	142308	1	MOTOR, Engine starter (Dual Fuel Engines)
	147125	1	MOTOR, Engine starter (Diesel Fuel Engines)
MS1	143518	1	SENSOR, Manifold Absolute Pressure (GM)
OCM1	132804	1	MODULE, Outrigger Auto-Level Control
OL1	133133	1	LIGHT, Outrigger Indicator
OPS1	102838	1	OIL PRESSURE SWITCH (Diesel Fuel Engines)
OXS1	142315	1	SENSOR, Heated exhaust oxygen (GM)
OXS2	142299	1	SENSOR, Oxygen post-cat (GM)
PRV1	142340	1	PROPANE REGULATOR/VAPORIZER (GM)
PS1	102863	1	PRESSURE SWITCH (option) (trips at 2400 psi)
PT1	134432	1	TRANSDUCER, Pressure (CE)
RA1	-	-	ACTUATOR, Throttle Body (Dual Fuel Engines)
RL-22	107098	1	LIGHT, Optional rotating amber beacon
RL-29	107098	1	BEACON, Rotating Amber (Option)
			Parts list continued on the following page.

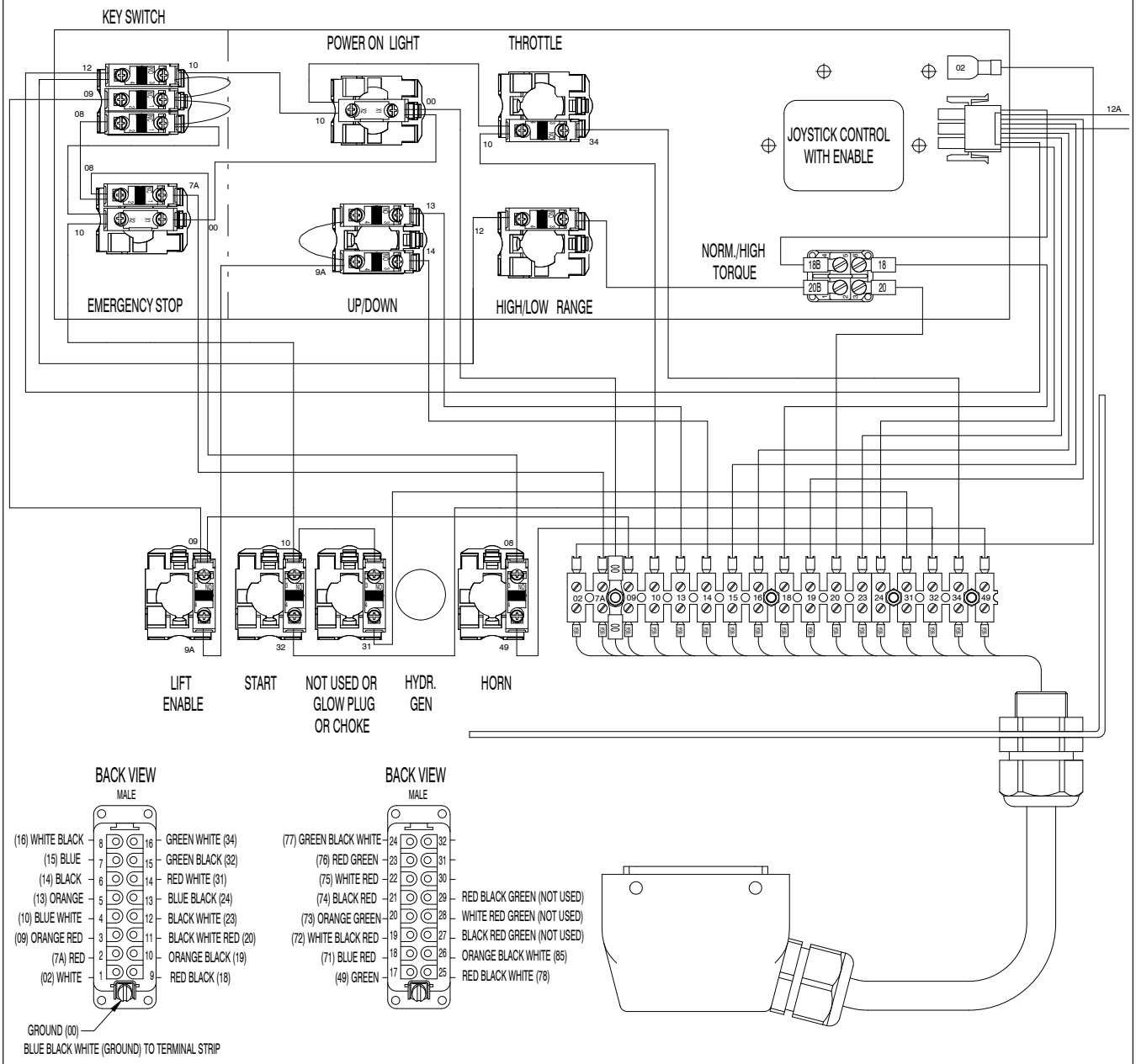
Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
RST2	108788	1	RESISTOR, 3 Ohm/100W
S1	119726	1	SWITCH, Main Power Disconnect
S2	147054	2	TOGGLE SWITCH, Up/Off/Down (Base control console)
S3	147054	1	N.O. CONTACT, Off/Lift/Drive select key switch (Platform)
	147053	2	N.C. CONTACT, Off/Lift/Drive select key switch (Platform)
S4	147053	1	N.C. CONTACT, Emergency stop switch (Platform) **(ANSI/CSA)**
	147053	2	N.C. CONTACT, Off/Lift/Drive select key switch (Platform) **(CE)**
S5	147054	2	N.O. CONTACT, Up/Down switch (Platform)
S6	147053	1	N.C. CONTACT, Emergency stop switch (Base control console)
S7	132537	1	CONTROLLER ASSEMBLY, Drive/steer
S7-1	122869	1	• SWITCH W/ACTUATOR, 2nd Speed
S7-2	122877	1	• SWITCH, Right steer
S7-3	122877	1	• SWITCH, Left steer
S7-4	122869	1	• SWITCH W/ACTUATOR, Reverse drive
S7-5	122869	1	• SWITCH W/ACTUATOR, Forward drive
S7-6	122869	1	• SWITCH W/ACTUATOR, 3rd Speed
S7-7	122872	1	• SWITCH, Enable push button
S8	147054	1	N.O. CONTACT, Horn switch (Platform)
S9	147054	1	N.O. CONTACT, Lift enable switch (Platform)
S9A	102853	1	SWITCH, Outrigger enable
S9B	127132	1	SWITCH, Outrigger enable
S10	147054	2	SWITCH, N.O. contact (Base control console) **(ANSI/CSA)**
		1	SWITCH, N.O. contact (Base control console) **(CE)**
	147053	1	SWITCH, N.C. contact (Base control console) **(CE)**
S11	102853	1	TOGGLE SWITCH, Front platform extend/retract (Platform)
S11A	102853	1	TOGGLE SWITCH, Rear platform extend/retract (Platform)
S12	102853	1	SWITCH, Hydraulic Generator (Platform)
S13	147054	1	N.O. CONTACT, Choke switch or Glow plug switch (Platform)
S14	147054	1	N.O. CONTACT, Low/high throttle switch (Platform)
S15	147054	1	N.O. CONTACT, Engine start switch (Platform)
S20	102853	1	TOGGLE SWITCH, Left Front Outrigger Up/down
S20A	127132	1	SWITCH, Front left outrigger up/down toggle
S21	102853	1	TOGGLE SWITCH, Right Front Outrigger Up/down
S21A	127132	1	SWITCH, Front right outrigger up/down toggle
S22	102853	1	TOGGLE SWITCH, Right Rear Outrigger Up/down
S22A	127132	1	SWITCH, Rear right outrigger up/down toggle
S23	102853	1	TOGGLE SWITCH, Left Rear Outrigger Up/down
S23A	127132	1	SWITCH, Rear left outrigger up/down toggle
S24	102853	1	SWITCH, Auto-Level Outrigger
S29	147054	1	N.O. CONTACT, Low/high range (Platform)
S30	124446	1	SWITCH, Engine off/on (Engine panel)
			Parts list continued on the following page.

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from the previous page.
S31	102853	1	SWITCH, Engine glow plug (Engine panel) (Diesel Fuel Engines)
S33	115574	1	SWITCH, Gas/Propane Fuel Select Toggle (GM)
S34	102853	1	TOGGLE SWITCH, Front powered platform enable
S34A	102853	1	TOGGLE SWITCH, Rear powered platform enable
S41	114373	1	TOGGLE SWITCH, High/Low Torque (Platform)
S51	103141	1	N.O. CONTACT, Emergency lowering switch **(CE, Model 9250)**
S52	103141	1	N.O. CONTACT, Powered extension emergency retraction switch
TPS1	143743	1	TEMPERATURE SENSOR, Coolant (Dual Fuel Engines)
	113400	1	TEMPERATURE SWITCH, Engine (Kubota Diesel)
TPS2	143827	1	TEMPERATURE SENSOR, Air intake (Dual Fuel Engines)
TT	103336	1	METER, Hour

3.5 Platform Control Console Wiring - All Options (ANSI/CSA)

View Parts List

CONTROL BOX HARNESS		PIN # - FUNCTION	JOYSTICK HARNESS	
24	BLUE/BLACK	PIN 1 - LEFT	24	WHITE/RED
12	BROWN/RED	PIN 2 - JOYSTICK VS+	12	WHITE/BLACK
23	BLACK/WHITE	PIN 3 - RIGHT	23	WHITE
16	WHITE / BLACK	PIN 4 - FORWARD	16	YELLOW
12A	BROWN/RED	PIN 5 - STEERING VS+	12A	WHITE/GREEN
15	BLUE	PIN 6 - REVERSE	15	GREY
19	ORANGE/BLACK	PIN 7 - 2nd SPEED	19	BROWN
12A	BROWN/RED	PIN 8 - ENABLE VS+	12A	WHITE/BLUE
18B	RED/BLACK	PIN 9 - 3rd SPEED	18B	RED/BLACK

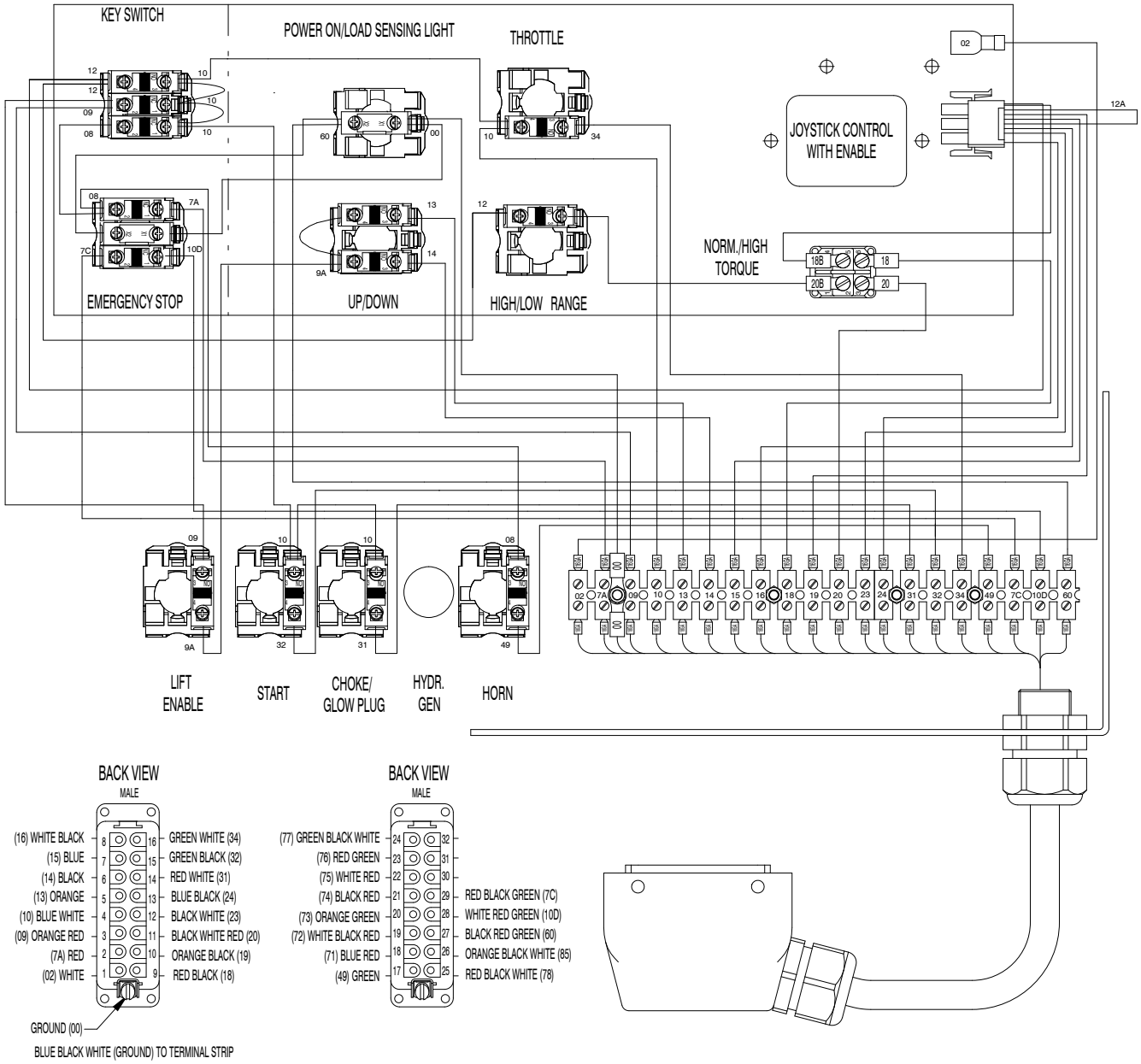


M147234AE

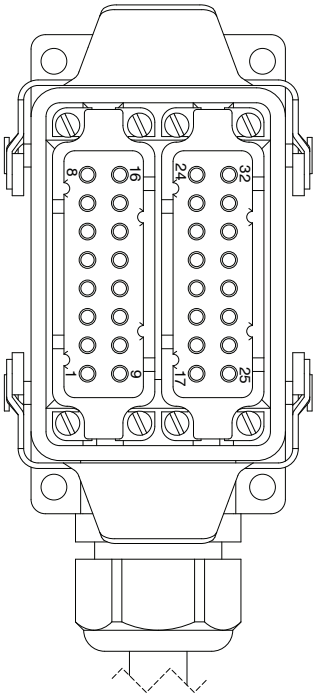
3.6 Platform Control Console Wiring - All Options (CE)

View Parts List

CONTROL BOX HARNESS		PIN # - FUNCTION	JOYSTICK HARNESS	
24	BLUE/BLACK	PIN 1 - LEFT	24	WHITE/RED
12	BROWN/RED	PIN 2 - JOYSTICK VS+	12	WHITE/BLACK
23	BLACK/WHITE	PIN 3 - RIGHT	23	WHITE
16	WHITE /BLACK	PIN 4 - FORWARD	16	YELLOW
12A	BROWN/RED	PIN 5 - STEERING VS+	12A	WHITE/GREEN
15	BLUE	PIN 6 - REVERSE	15	GREY
19	ORANGE/BLACK	PIN 7 - 2nd SPEED	19	BROWN
12A	BROWN/RED	PIN 8 - ENABLE VS+	12A	WHITE/BLUE
18B	RED/BLACK	PIN 9 - 3rd SPEED	18B	RED/BLACK



M147223AE



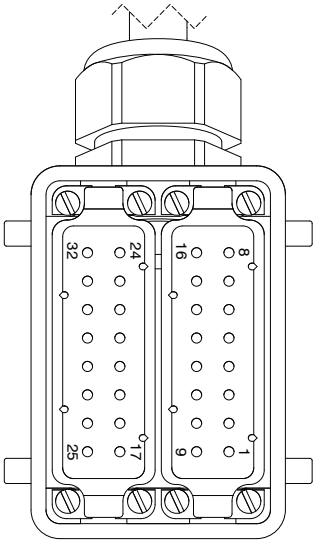
INSERTS 1-16

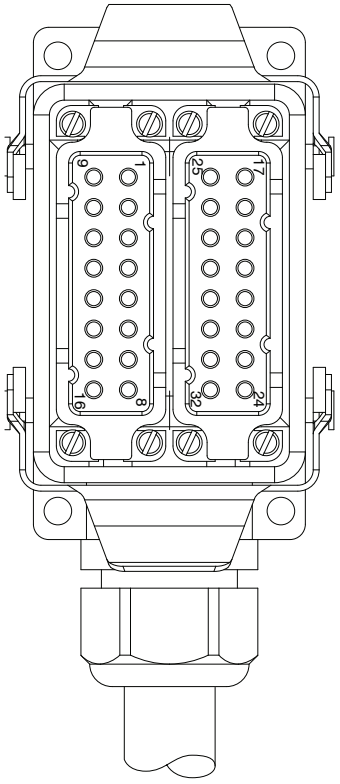
PIN 1 - WHITE (02)
PIN 2 - RED (7A)
PIN 3 - ORANGE RED (09)
PIN 4 - BLUE WHITE (10)
PIN 5 - ORANGE (13)
PIN 6 - BLACK (14)
PIN 7 - BLUE (15)
PIN 8 - WHITE BLACK (16)
PIN 9 - RED BLACK (18)
PIN 10 - ORANGE BLACK (19)
PIN 11 - BLACK WHITE RED (20)
PIN 12 - BLACK WHITE (23)
PIN 13 - BLUE BLACK (24)
PIN 14 - RED WHITE (31)
PIN 15 - GREEN BLACK (32)
PIN 16 - GREEN WHITE (34)
GROUND TERMINAL - BLUE BLACK WHITE

INSERTS: 17-32

PIN 17 - GREEN (49)
PIN 18 - BLUE RED (71)
PIN 19 - WHITE BLACK RED (72)
PIN 20 - ORANGE GREEN (73)
PIN 21 - BLACK RED (74)
PIN 22 - WHITE RED (75)
PIN 23 - RED GREEN (76)
PIN 24 - GREEN BLACK WHITE (77)
PIN 25 - RED BLACK WHITE (78)
PIN 26 - ORANGE BLACK WHITE (85)
PIN 27 - BLACK RED GREEN (60)
PIN 28 - WHITE RED GREEN (10D)
PIN 29 - RED BLACK GREEN (7C)
PIN 30 - EMPTY
PIN 31 - EMPTY
PIN 32 - EMPTY
GROUND TERMINAL - EMPTY

View Parts List



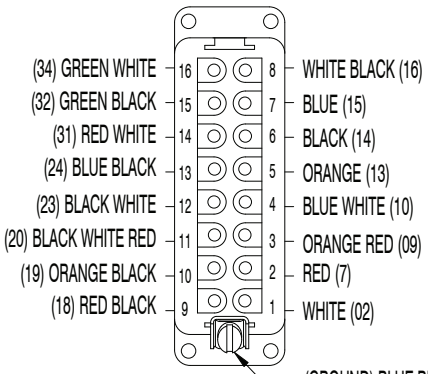


TO CONTROL BOX

TO CONTROL BOX

BACK VIEW

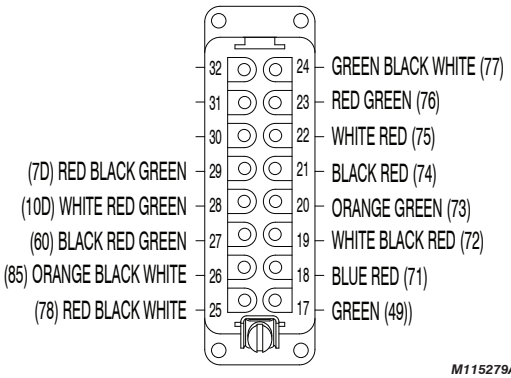
FEMALE



(GROUND) BLUE BLACK WHITE TO (00) GROUND

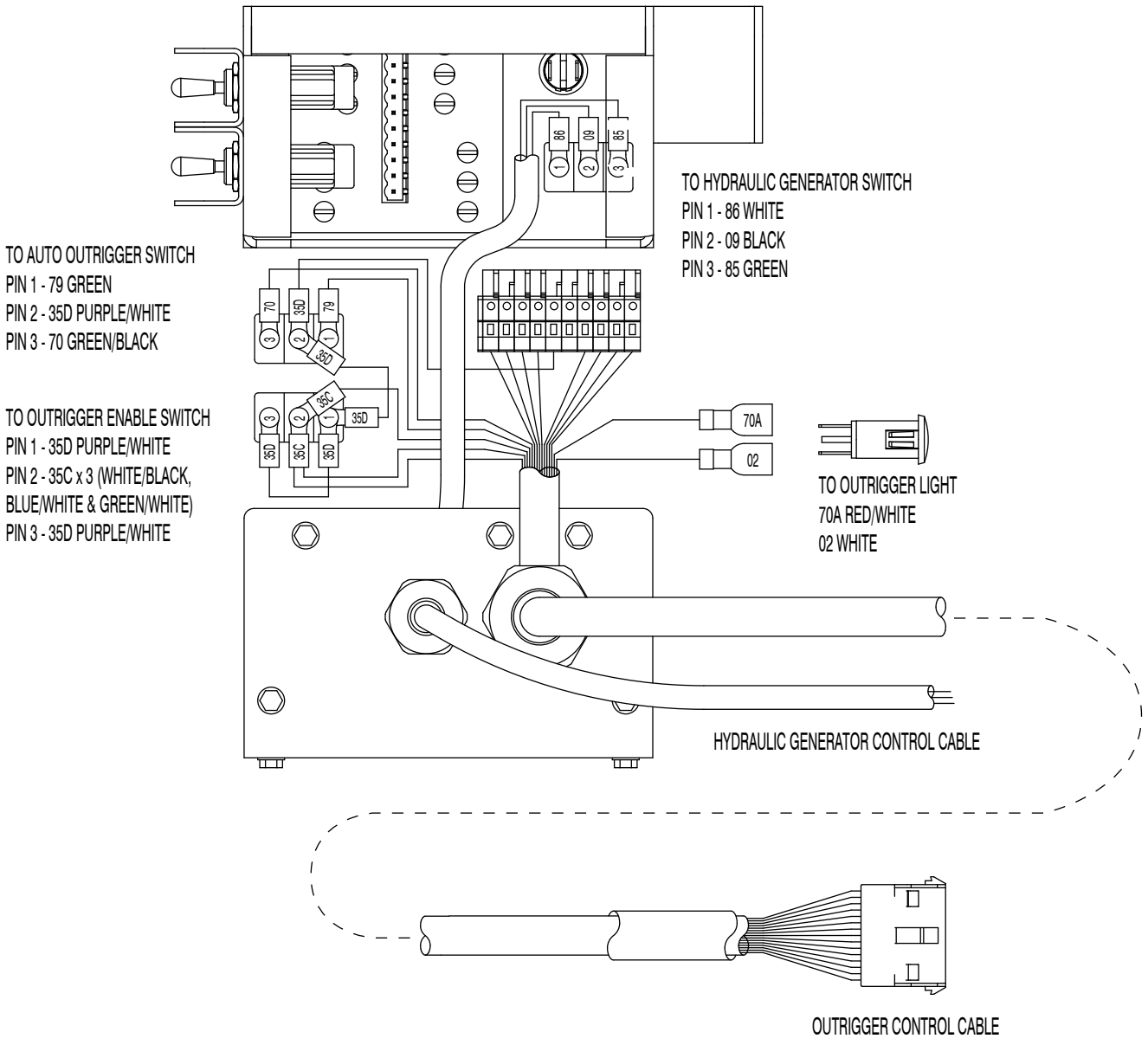
BACK VIEW

FEMALE

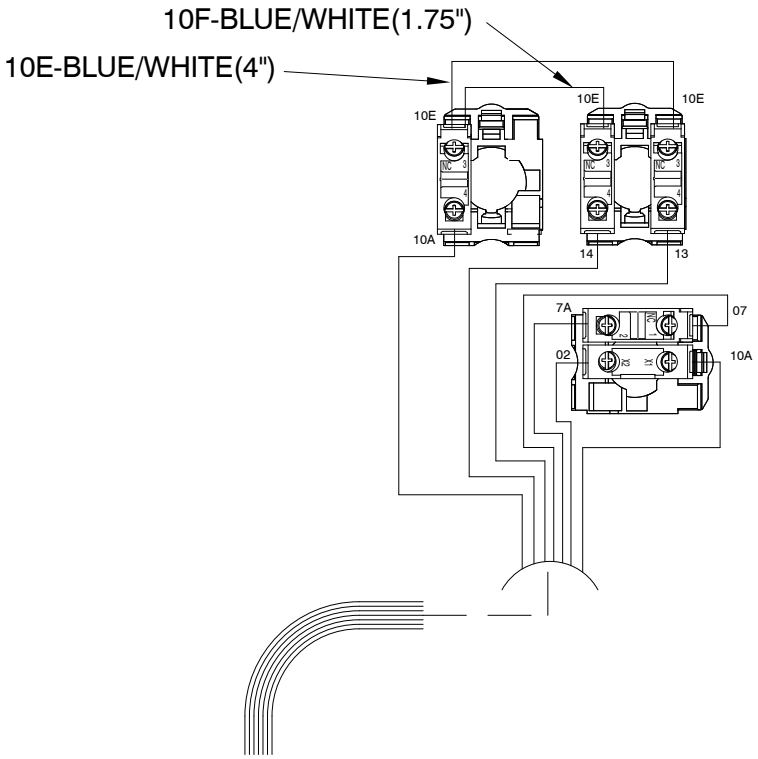


M115279AD_M115284AE

View Parts List


TO AUTO OUTRIGGER SWITCH
PIN 1 - 79 GREEN
PIN 2 - 35D PURPLE/WHITE
PIN 3 - 70 GREEN/BLACK
TO OUTRIGGER ENABLE SWITCH
PIN 1 - 35D PURPLE/WHITE
PIN 2 - 35C x 3 (WHITE/BLACK, BLUE/WHITE & GREEN/WHITE)
PIN 3 - 35D PURPLE/WHITE
TO HYDRAULIC GENERATOR SWITCH
PIN 1 - 86 WHITE
PIN 2 - 09 BLACK
PIN 3 - 85 GREEN
70A
02
TO OUTRIGGER LIGHT
70A RED/WHITE
02 WHITE
HYDRAULIC GENERATOR CONTROL CABLE
OUTRIGGER CONTROL CABLE

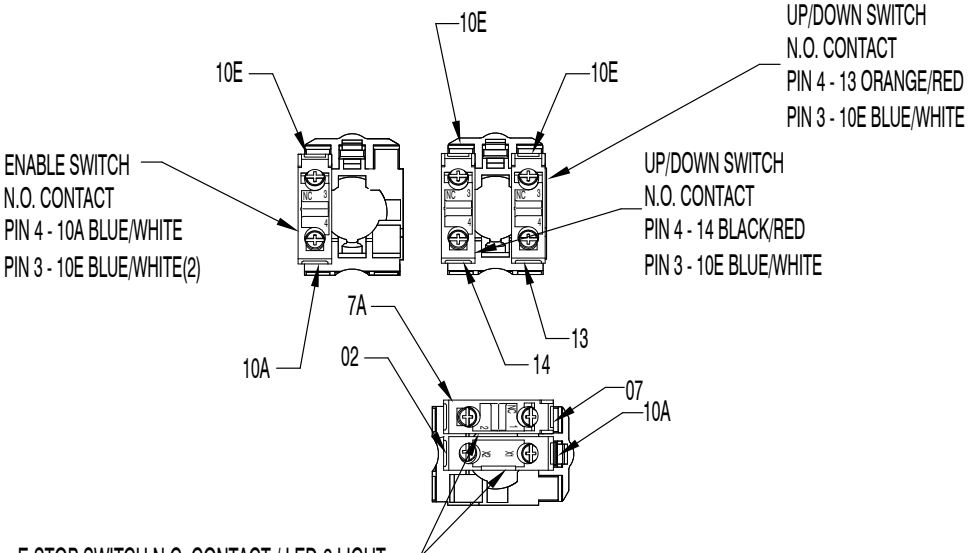
M129301AB



View Parts List

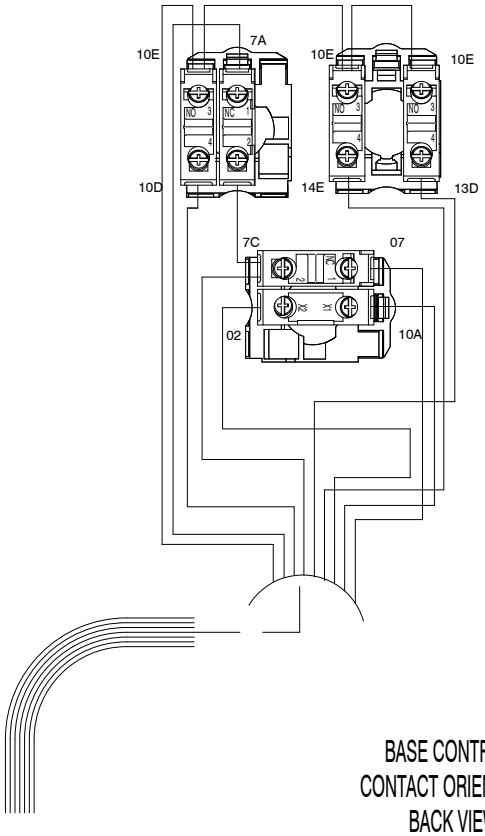
BASE CONTROL STATION.-6 WIRES
02 - WHITE
07 - RED
7A - RED/WHITE
10A - BLUE/WHITE
13 - ORANGE/RED
14 - BLACK/RED

BASE CONTROLS
CONTACT ORIENTATION
BACK VIEW



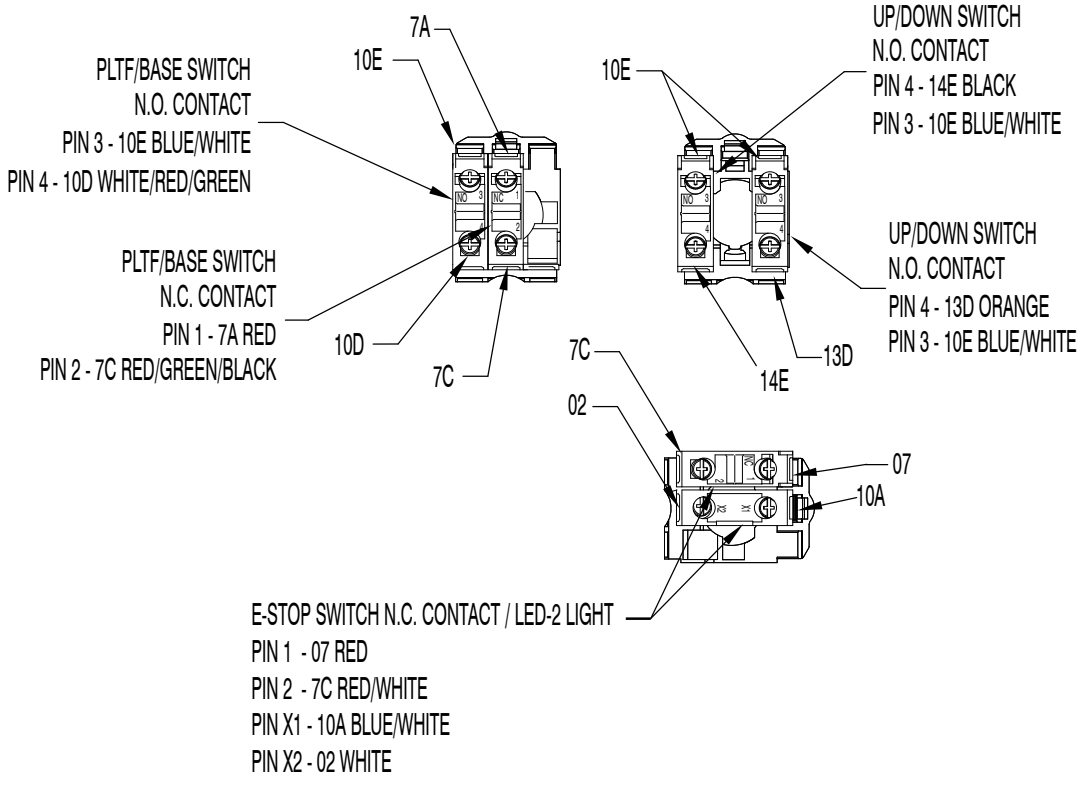
M147223AC

View Parts List



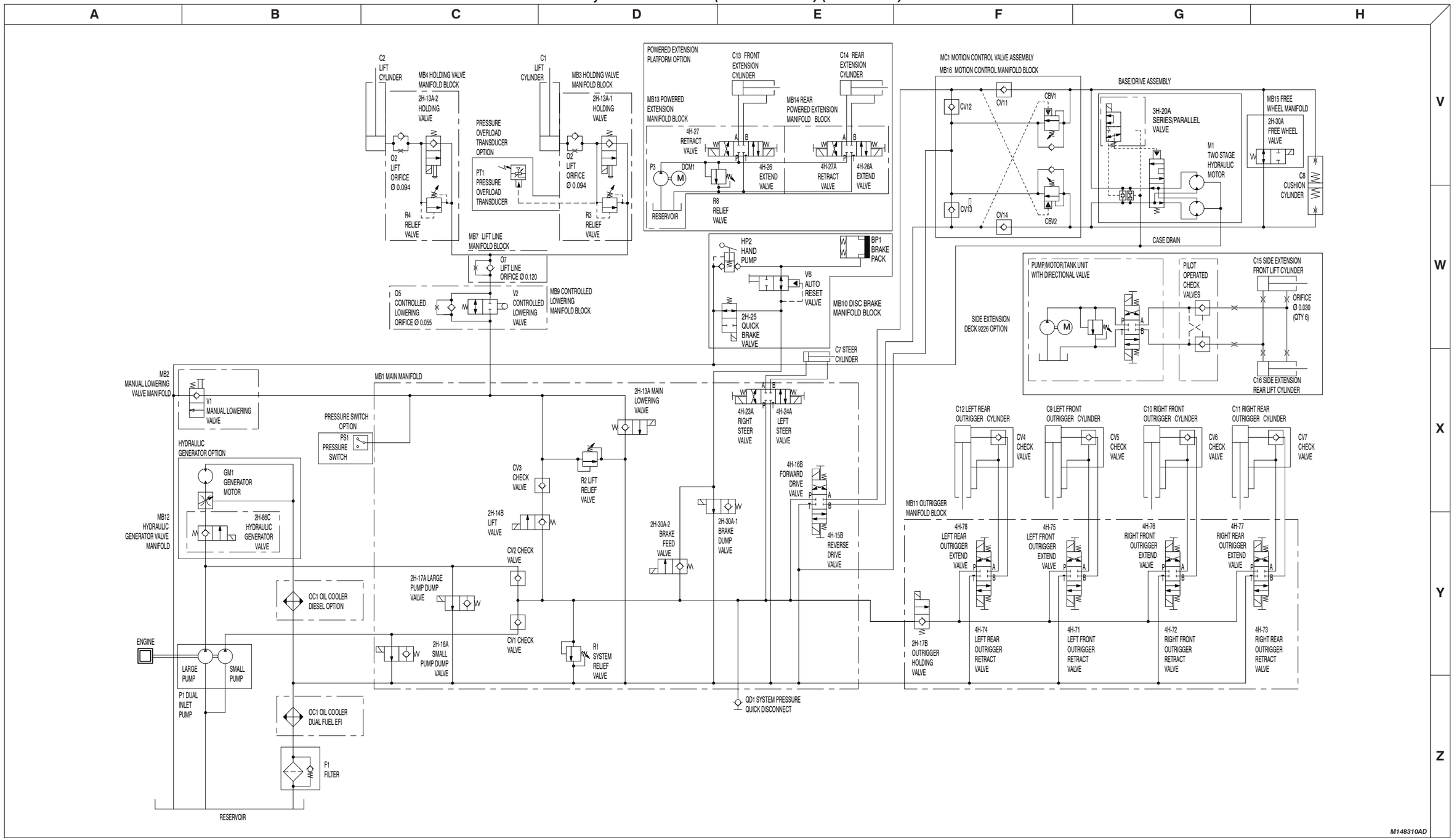
BASE CONTROLS - 9 WIRES
02 - WHITE
07 - RED
7A - RED/WHITE
7C - RED/GREEN/BLACK
10A - BLUE/WHITE
10D - WHITE/RED/GREEN
10E - BLUE/WHITE
13D - ORANGE/RED
14E - BLACK/RED

BASE CONTROLS
CONTACT ORIENTATION
BACK VIEW

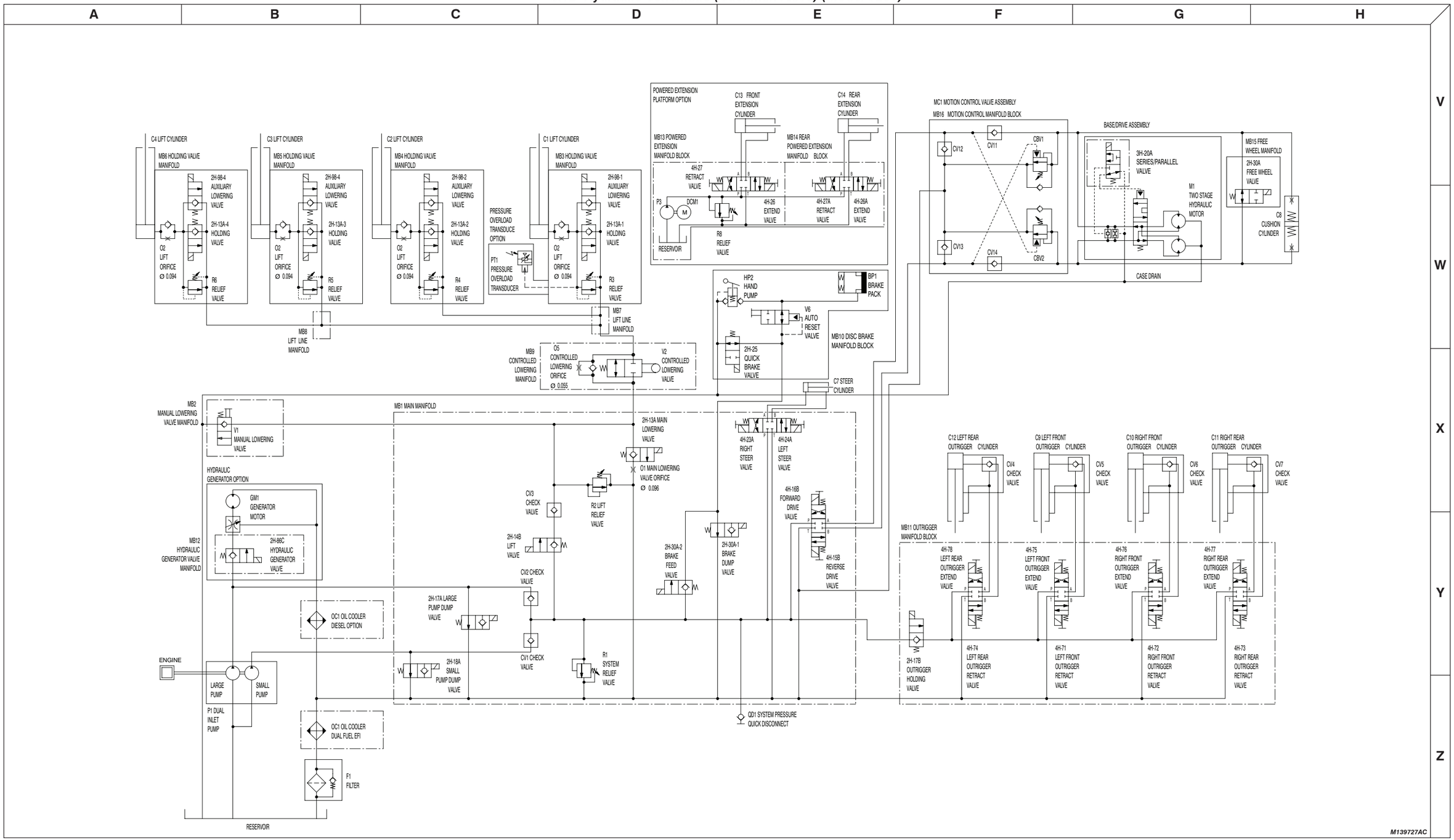


M129301AB

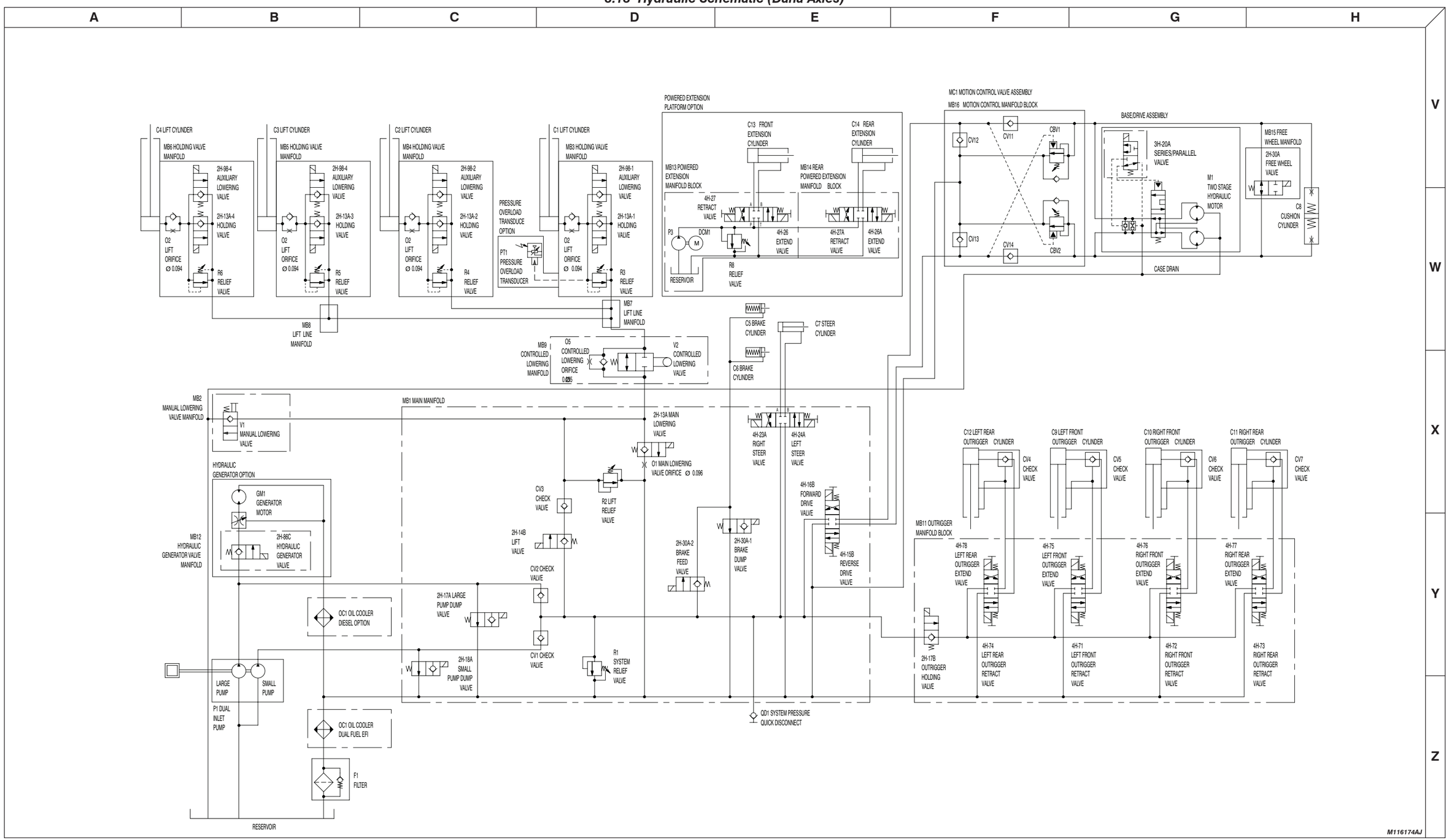
3.11 Hydraulic Schematic (Cushman Axles) (Model 9241)

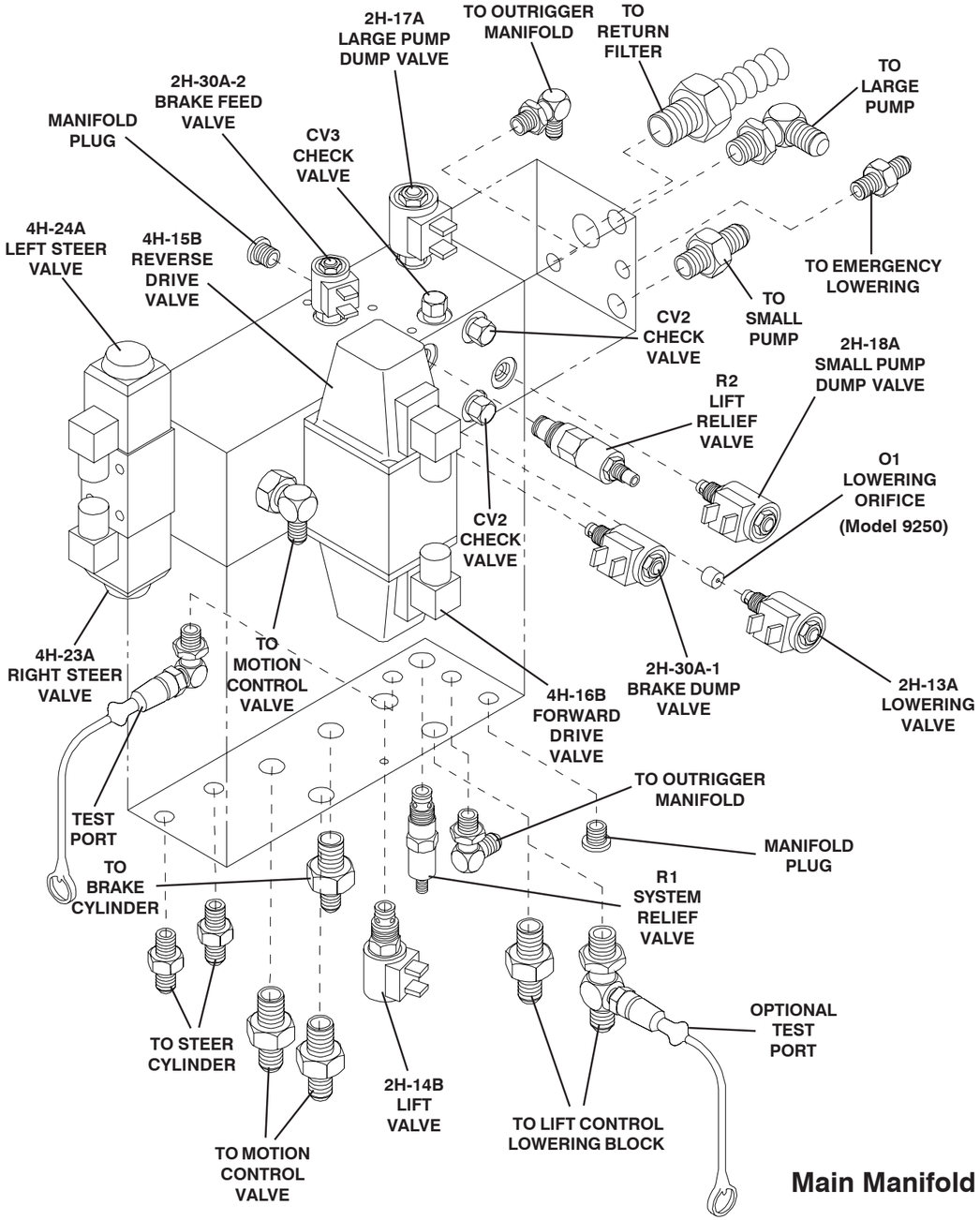


3.12 Hydraulic Schematic (Cushman Axles) (Model 9250)



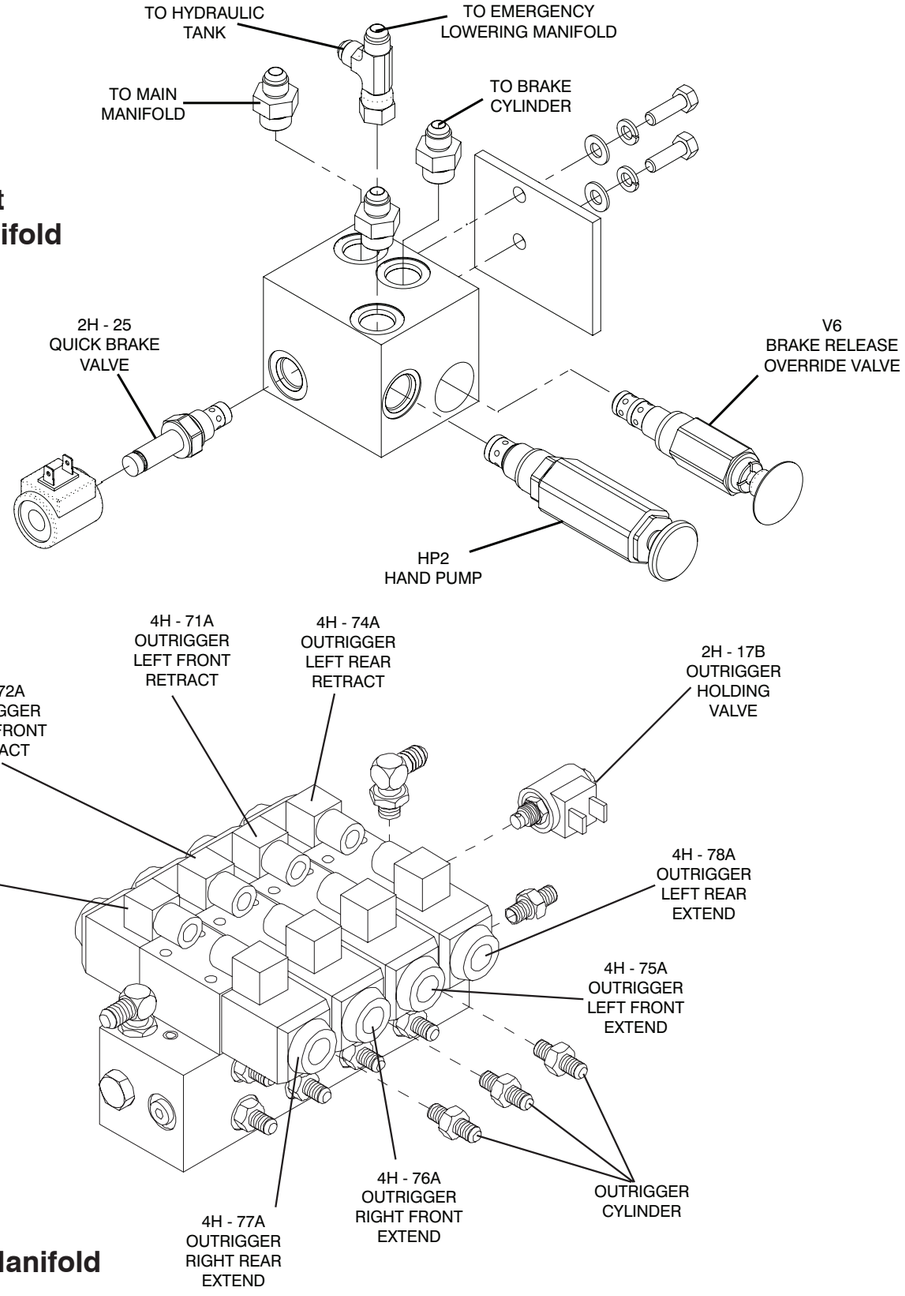
3.13 Hydraulic Schematic (Dana Axles)





Main Manifold

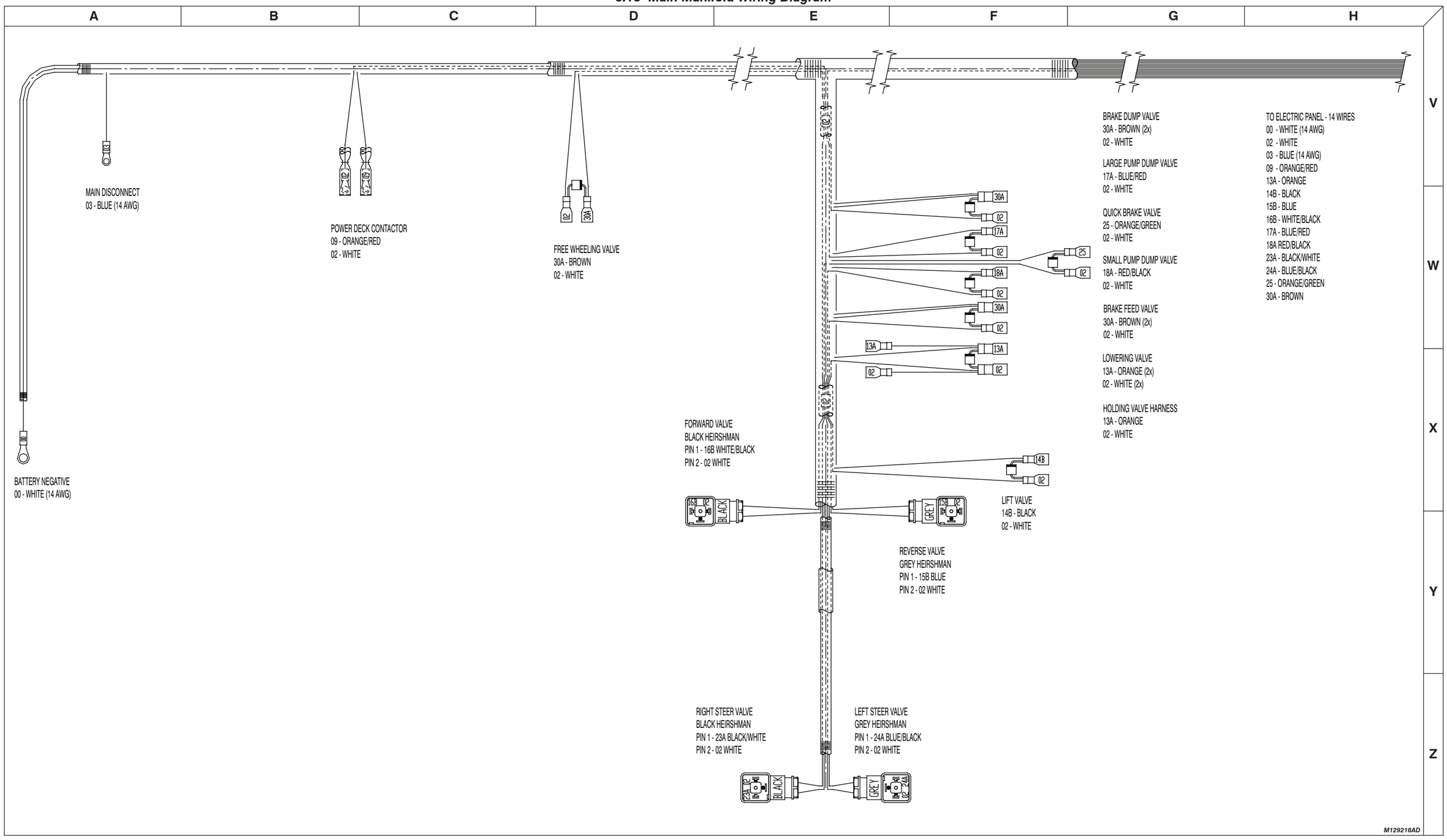
Auto Reset Brake Manifold



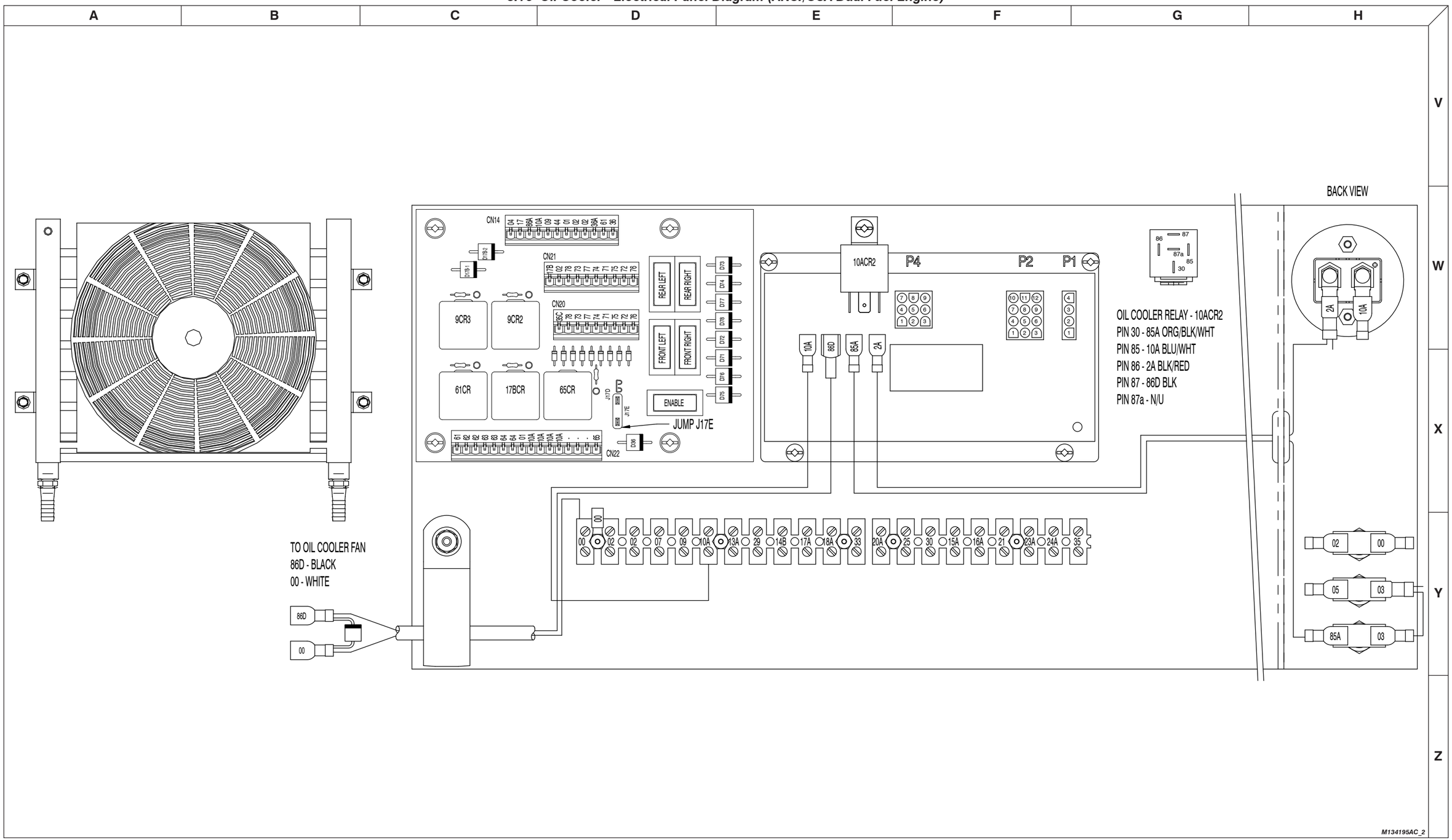
Outrigger Manifold

M50152AB HMC-PI2 HMC-PI1

3.15 Main Manifold Wiring Diagram

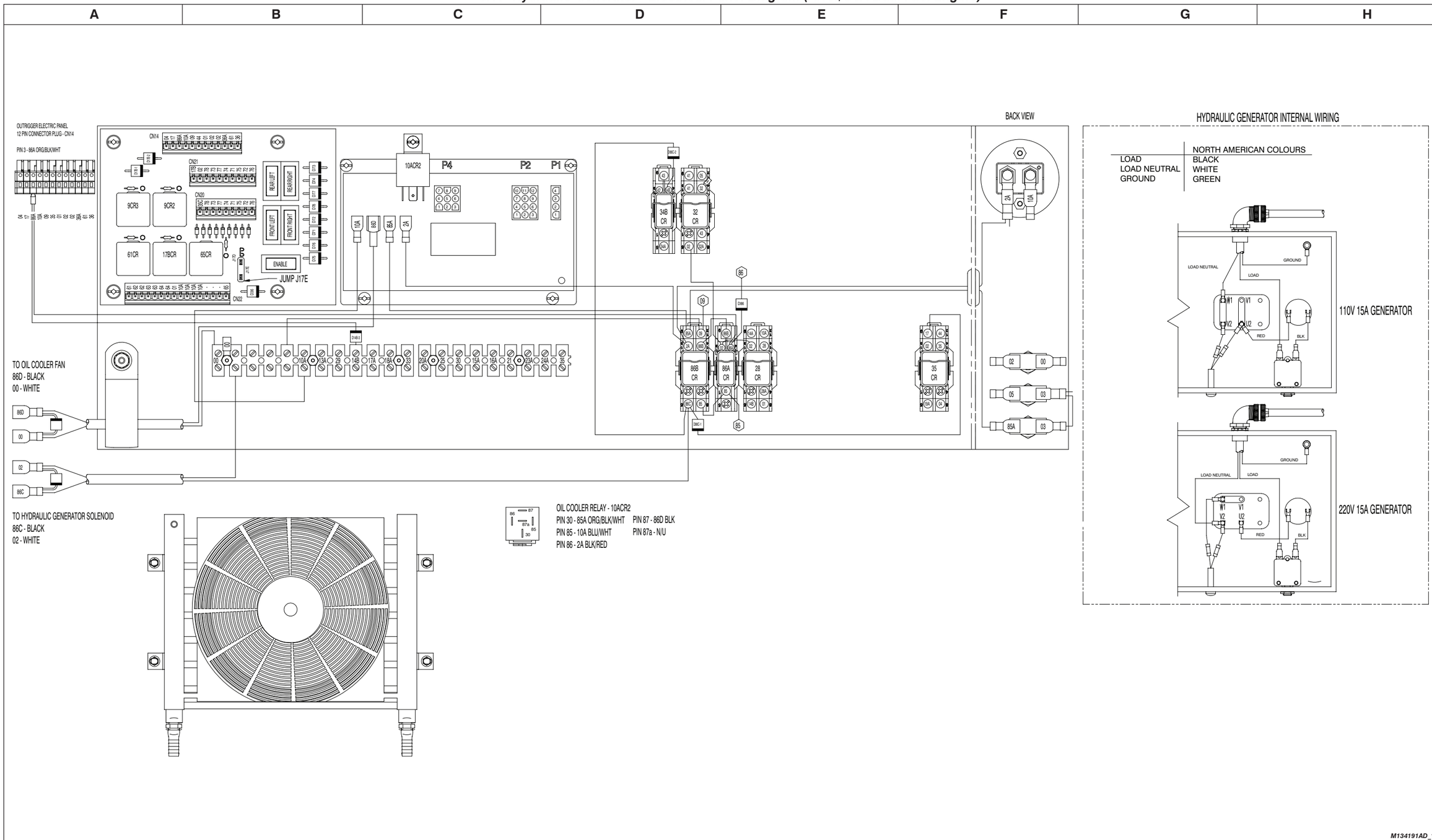


3.16 Oil Cooler - Electrical Panel Diagram (ANSI/CSA Dual Fuel Engine)



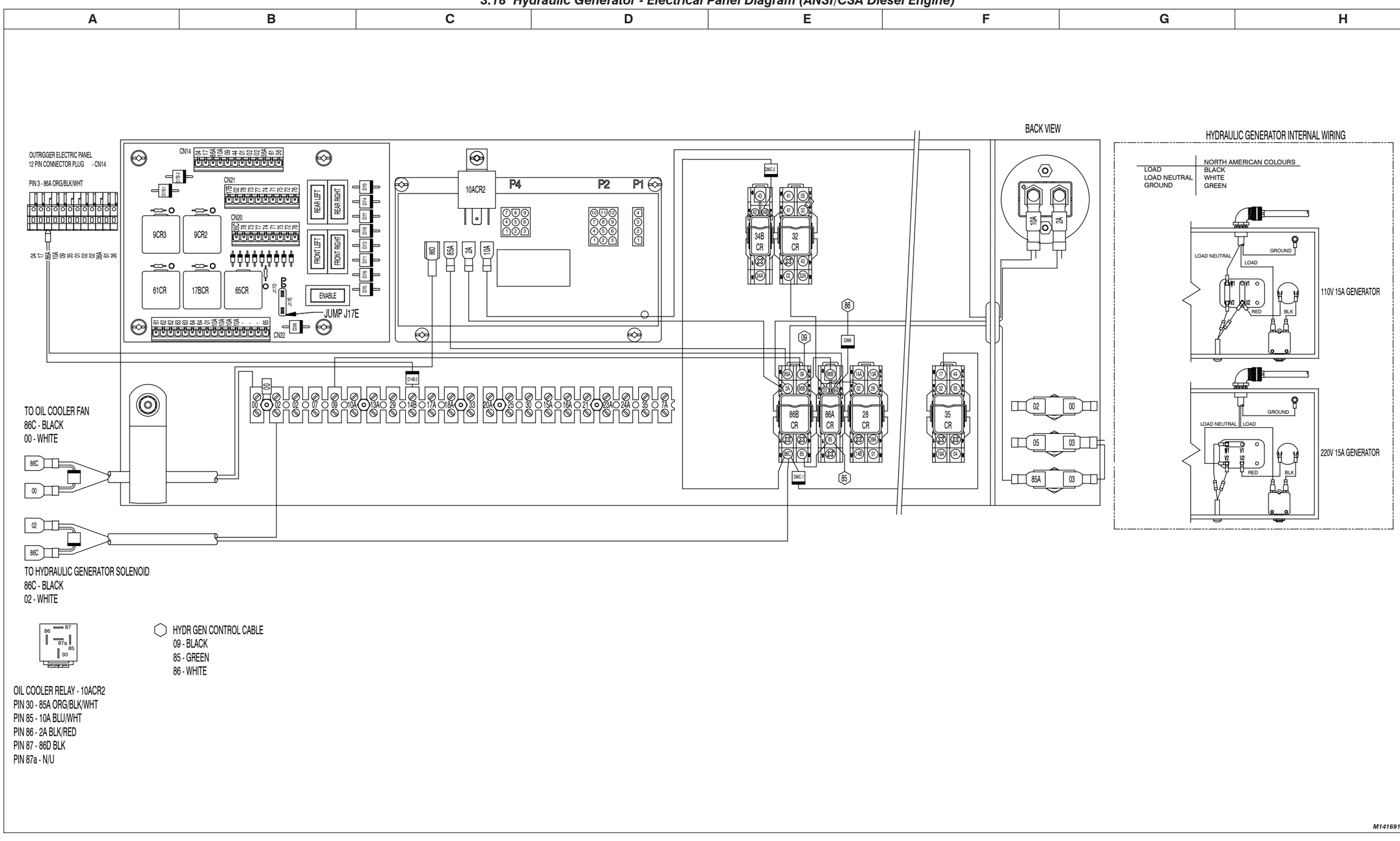
M134195AC_2

3.17 Hydraulic Generator - Electrical Panel Diagram (ANSI/CSA Dual Fuel Engine)

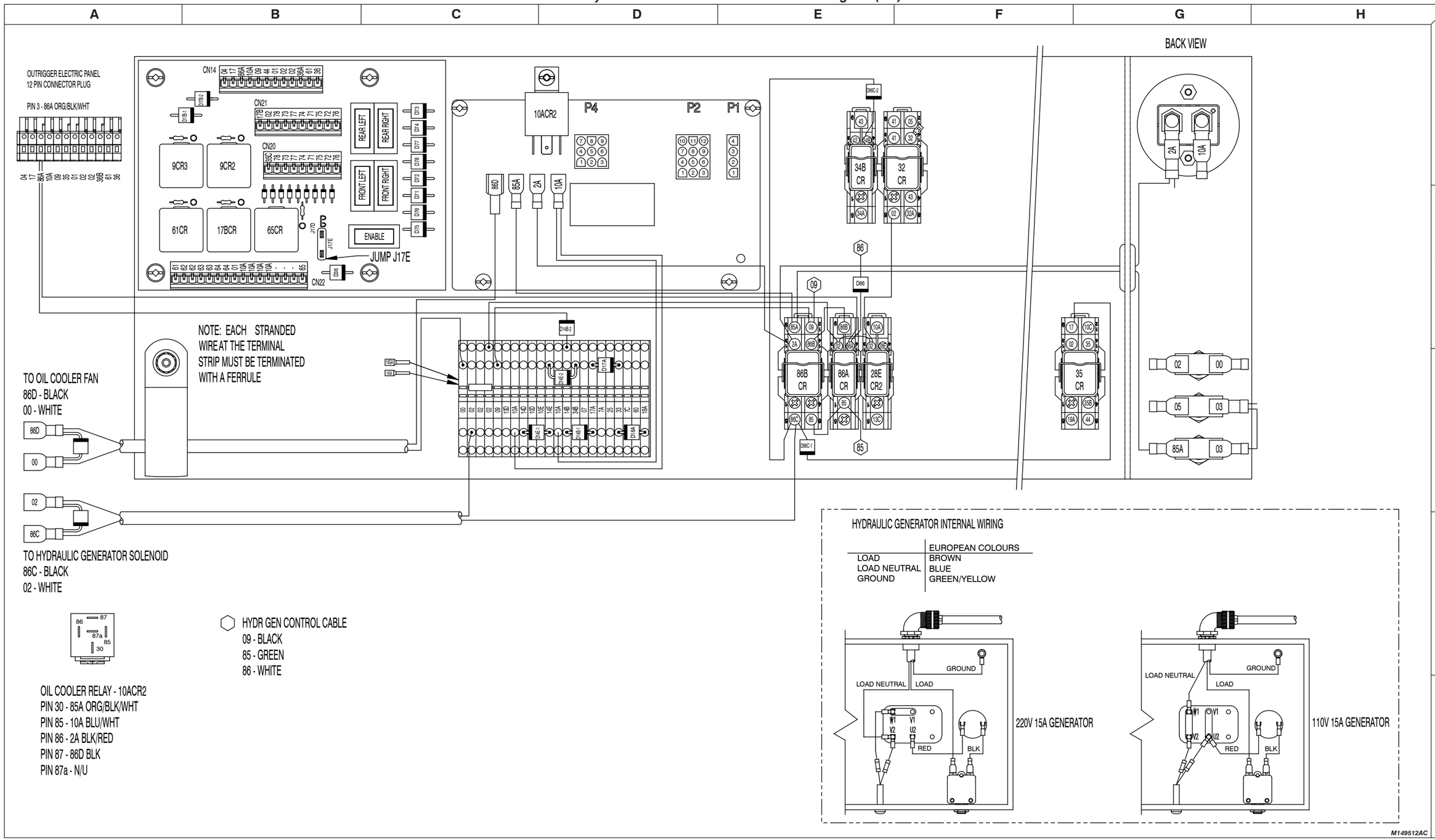


M134191AD_1

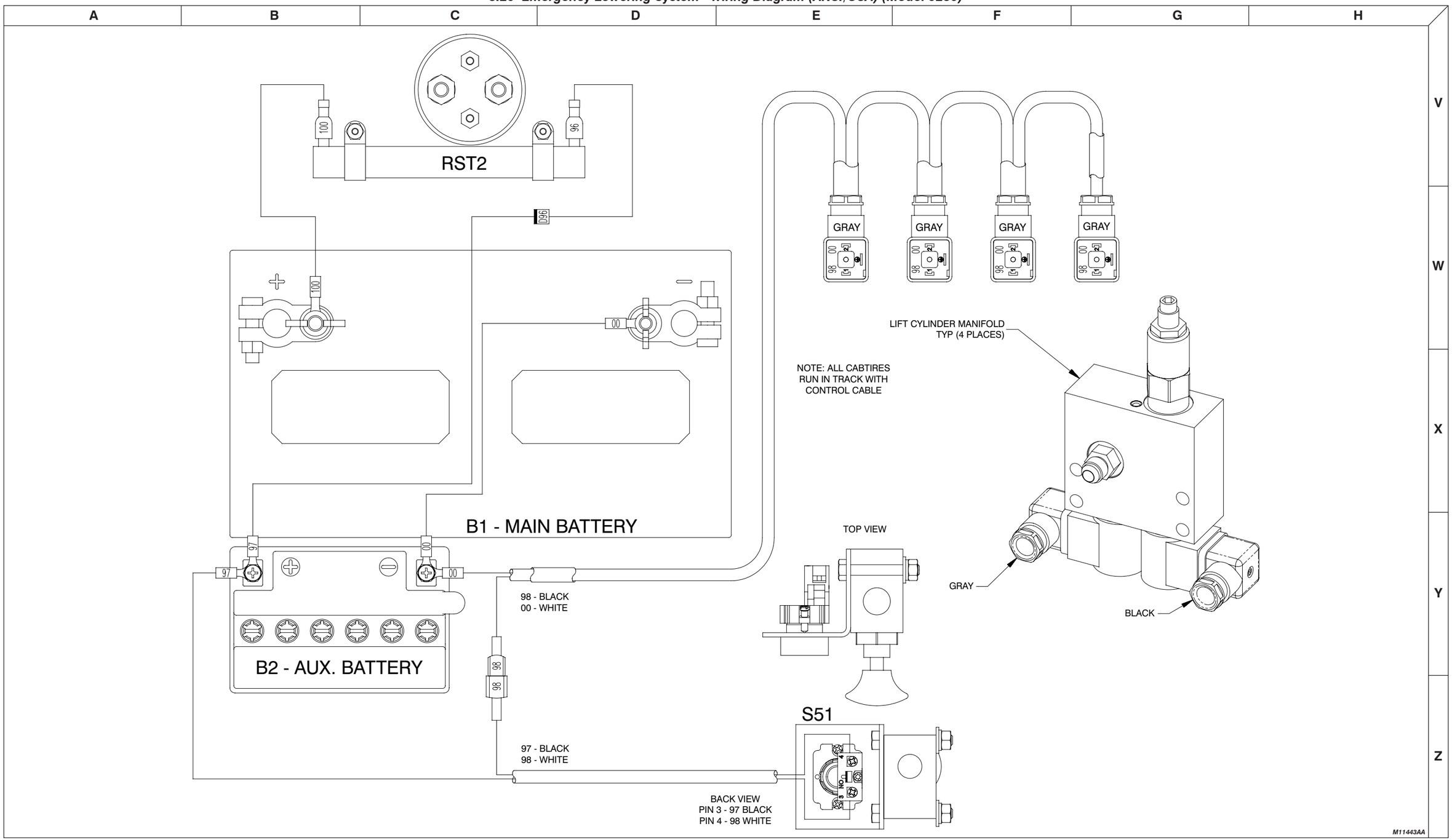
3.18 Hydraulic Generator - Electrical Panel Diagram (ANSI/CSA Diesel Engine)



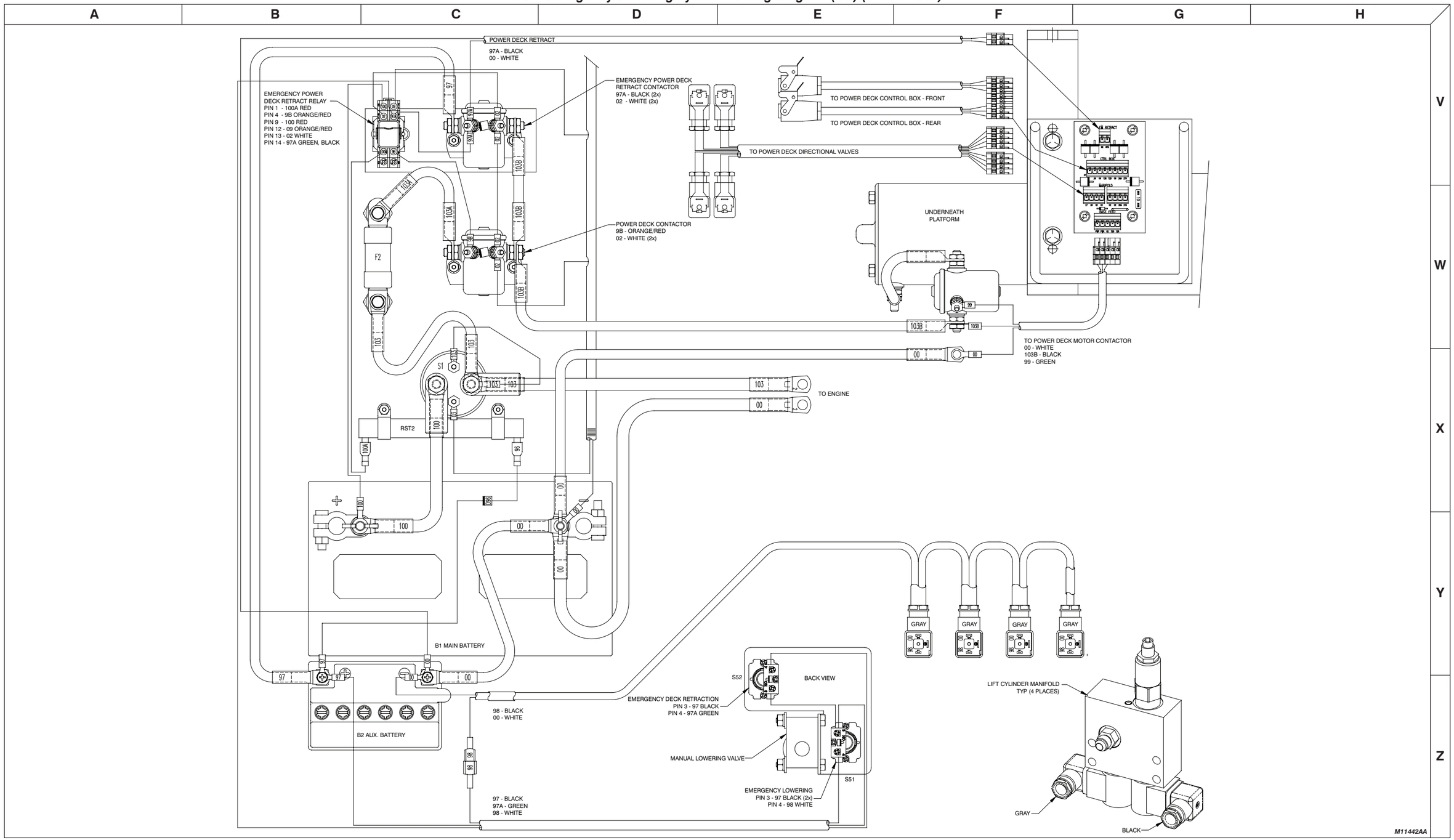
3.19 Hydraulic Generator - Electrical Panel Diagram (CE)



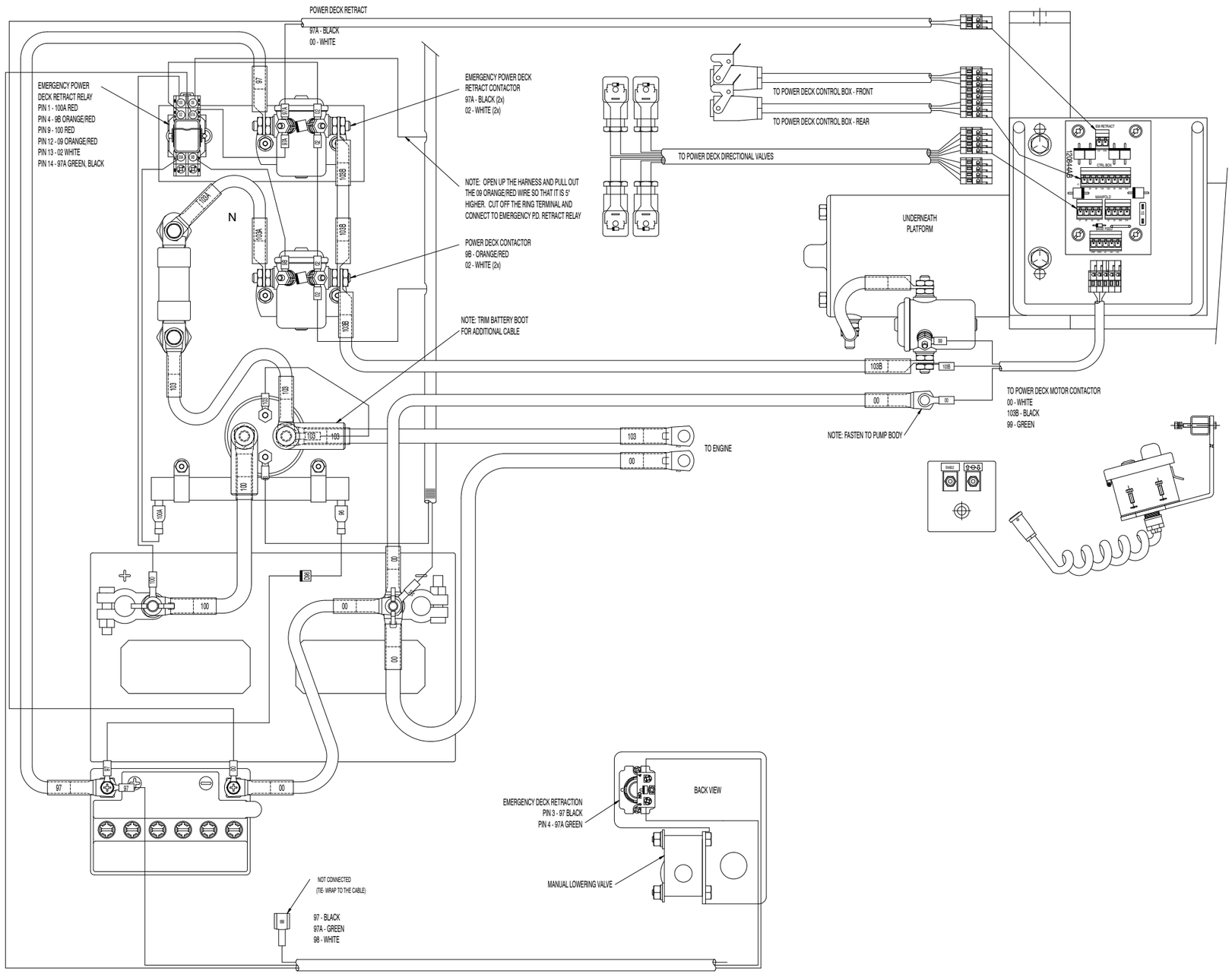
3.20 Emergency Lowering System - Wiring Diagram (ANSI/CSA) (Model 9250)



3.21 Emergency Lowering System - Wiring Diagram (CE) (Model 9250)

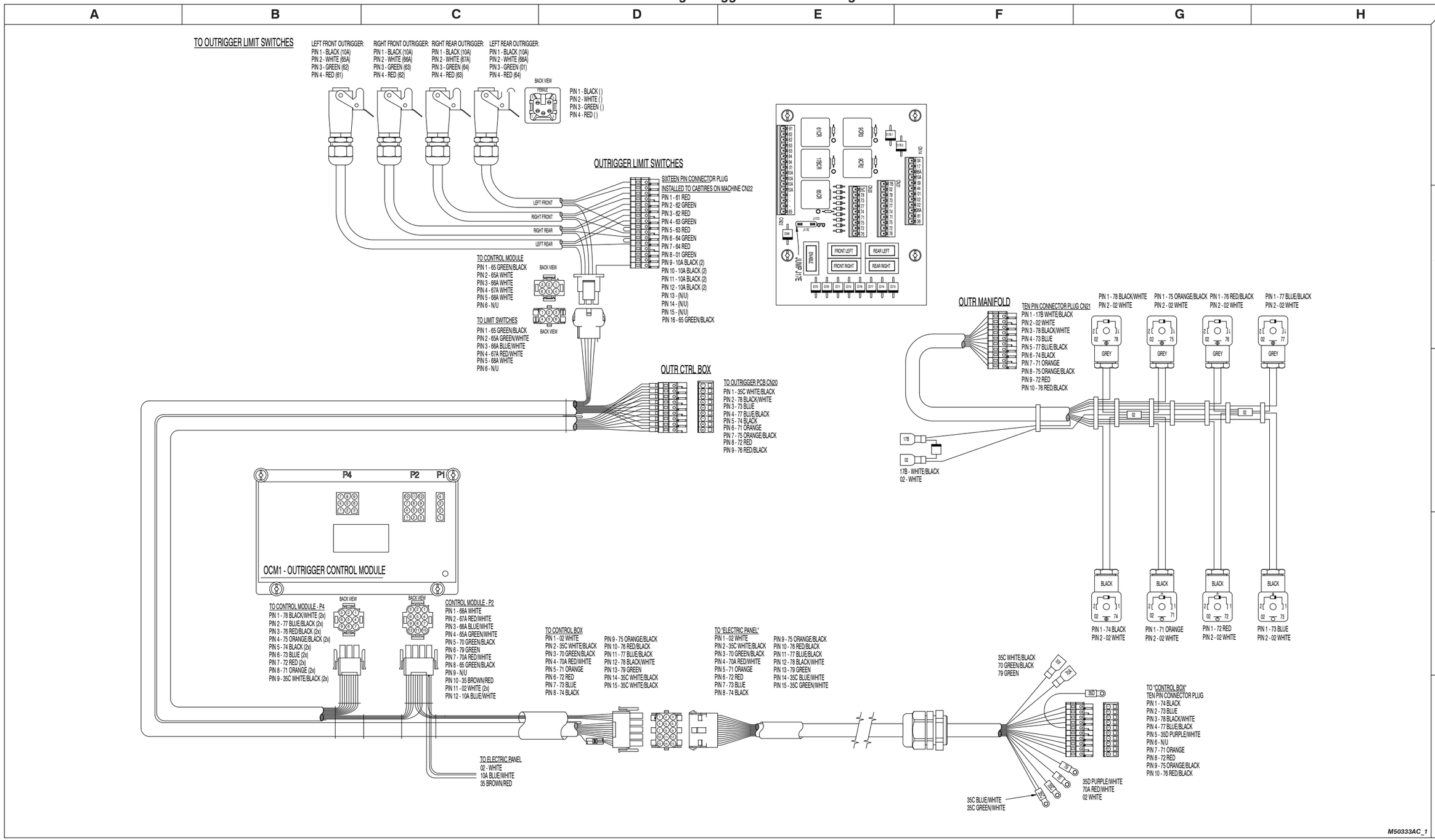


3.22 Emergency Lowering System - Electrical Wiring Diagram (CE) (Model 9241)

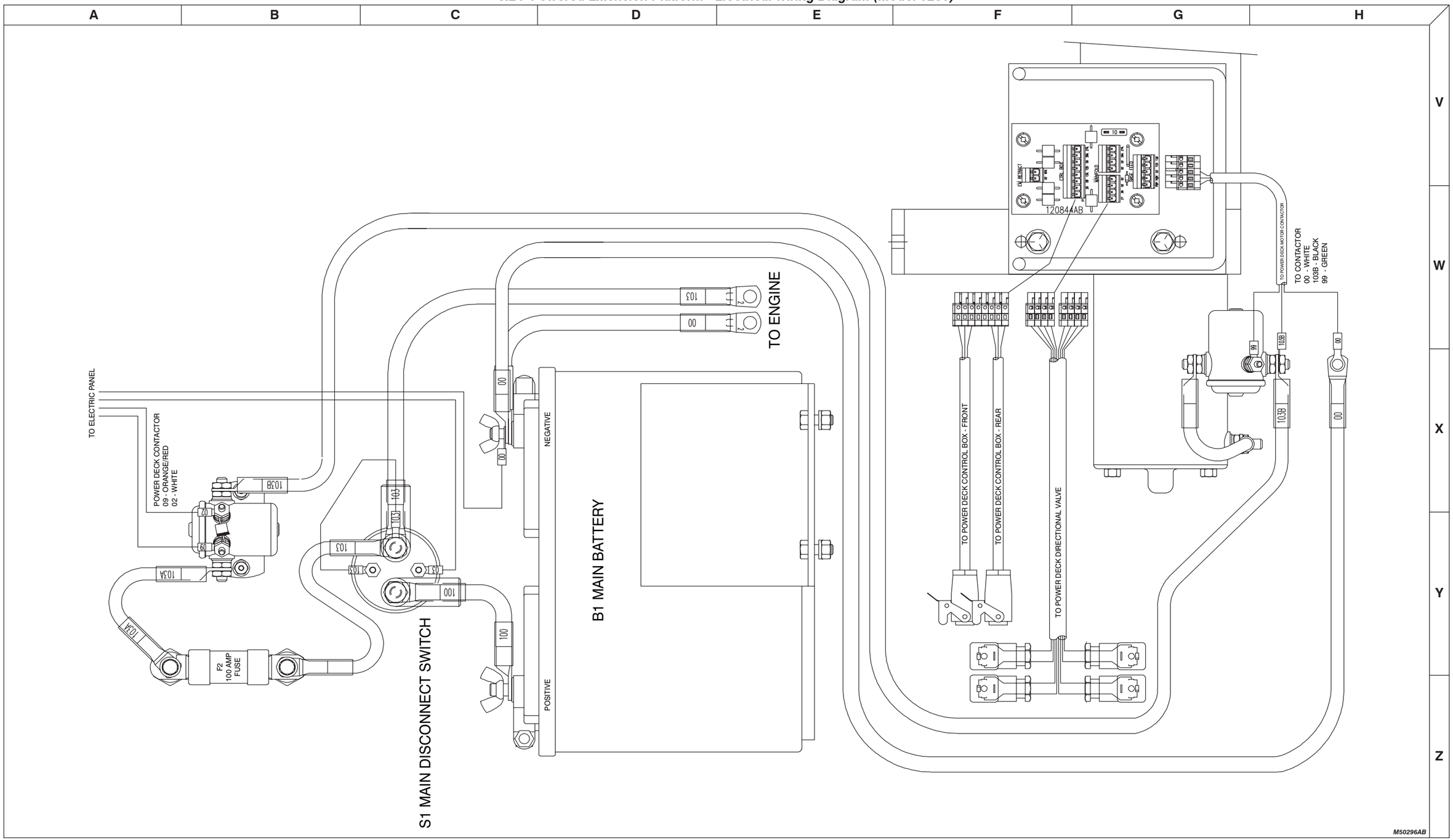


M148308AA_1

3.23 AutoLeveling Outrigger Connection Diagram


TO OUTRIGGER LIMIT SWITCHES
LEFT FRONT OUTRIGGER:
PIN 1 - BLACK (10A)
PIN 2 - WHITE (65A)
PIN 3 - GREEN (62)
PIN 4 - RED (61)
RIGHT FRONT OUTRIGGER:
PIN 1 - BLACK (10A)
PIN 2 - WHITE (66A)
PIN 3 - GREEN (63)
PIN 4 - RED (62)
RIGHT REAR OUTRIGGER:
PIN 1 - BLACK (10A)
PIN 2 - WHITE (67A)
PIN 3 - GREEN (64)
PIN 4 - RED (63)
LEFT REAR OUTRIGGER:
PIN 1 - BLACK (10A)
PIN 2 - WHITE (68A)
PIN 3 - GREEN (01)
PIN 4 - RED (64)
BACK VIEW
FEMALE
PIN 1 - BLACK ( )
PIN 2 - WHITE ( )
PIN 3 - GREEN ( )
PIN 4 - RED ( )
OUTRIGGER LIMIT SWITCHES
SIXTEEN PIN CONNECTOR PLUG
INSTALLED TO CABTIRES ON MACHINE CN22
PIN 1 - 61 RED
PIN 2 - 62 GREEN
PIN 3 - 62 RED
PIN 4 - 63 GREEN
PIN 5 - 63 RED
PIN 6 - 64 GREEN
PIN 7 - 64 RED
PIN 8 - 01 GREEN
PIN 9 - 10A BLACK (2)
PIN 10 - 10A BLACK (2)
PIN 11 - 10A BLACK (2)
PIN 12 - 10A BLACK (2)
PIN 13 - (N/U)
PIN 14 - (N/U)
PIN 15 - (N/U)
PIN 16 - 65 GREEN/BLACK
LEFT FRONT
RIGHT FRONT
RIGHT REAR
LEFT REAR
TO CONTROL MODULE
PIN 1 - 65 GREEN/BLACK
PIN 2 - 65A WHITE
PIN 3 - 66A WHITE
PIN 4 - 67A WHITE
PIN 5 - 68A WHITE
PIN 6 - N/U
BACK VIEW
TO LIMIT SWITCHES
PIN 1 - 65 GREEN/BLACK
PIN 2 - 65A GREEN/WHITE
PIN 3 - 66A BLUE/WHITE
PIN 4 - 67A RED/WHITE
PIN 5 - 68A WHITE
PIN 6 - N/U
BACK VIEW
OUTR CTRL BOX
TO OUTRIGGER PCB CN20
PIN 1 - 35C WHITE/BLACK
PIN 2 - 78 BLACK/WHITE
PIN 3 - 73 BLUE
PIN 4 - 77 BLUE/BLACK
PIN 5 - 74 BLACK
PIN 6 - 71 ORANGE
PIN 7 - 75 ORANGE/BLACK
PIN 8 - 72 RED
PIN 9 - 76 RED/BLACK
OUTR MANIFOLD
TEN PIN CONNECTOR PLUG CN21
PIN 1 - 17B WHITE/BLACK
PIN 2 - 02 WHITE
PIN 3 - 78 BLACK/WHITE
PIN 4 - 73 BLUE
PIN 5 - 77 BLUE/BLACK
PIN 6 - 74 BLACK
PIN 7 - 71 ORANGE
PIN 8 - 75 ORANGE/BLACK
PIN 9 - 72 RED
PIN 10 - 76 RED/BLACK
PIN 1 - 78 BLACK/WHITE
PIN 2 - 02 WHITE
PIN 1 - 75 ORANGE/BLACK
PIN 2 - 02 WHITE
PIN 1 - 76 RED/BLACK
PIN 2 - 02 WHITE
PIN 1 - 77 BLUE/BLACK
PIN 2 - 02 WHITE
GREY
17B - WHITE/BLACK
02 - WHITE
BLACK
PIN 1 - 74 BLACK
PIN 2 - 02 WHITE
PIN 1 - 71 ORANGE
PIN 2 - 02 WHITE
PIN 1 - 72 RED
PIN 2 - 02 WHITE
PIN 1 - 73 BLUE
PIN 2 - 02 WHITE
OCM1 - OUTRIGGER CONTROL MODULE
P4
P2
P1
TO CONTROL MODULE - P4
PIN 1 - 78 BLACK/WHITE (2x)
PIN 2 - 77 BLUE/BLACK (2x)
PIN 3 - 76 RED/BLACK (2x)
PIN 4 - 75 ORANGE/BLACK (2x)
PIN 5 - 74 BLACK (2x)
PIN 6 - 73 BLUE (2x)
PIN 7 - 72 RED (2x)
PIN 8 - 71 ORANGE (2x)
PIN 9 - 35C WHITE/BLACK (2x)
BACK VIEW
CONTROL MODULE - P2
PIN 1 - 68A WHITE
PIN 2 - 67A RED/WHITE
PIN 3 - 66A BLUE/WHITE
PIN 4 - 65A GREEN/WHITE
PIN 5 - 70 GREEN/BLACK
PIN 6 - 79 GREEN
PIN 7 - 70A RED/WHITE
PIN 8 - 65 GREEN/BLACK
PIN 9 - N/U
PIN 10 - 35 BROWN/RED
PIN 11 - 02 WHITE (2x)
PIN 12 - 10A BLUE/WHITE
TO CONTROL BOX
PIN 1 - 02 WHITE
PIN 2 - 35C WHITE/BLACK
PIN 3 - 70 GREEN/BLACK
PIN 4 - 70A RED/WHITE
PIN 5 - 71 ORANGE
PIN 6 - 72 RED
PIN 7 - 73 BLUE
PIN 8 - 74 BLACK
PIN 9 - 75 ORANGE/BLACK
PIN 10 - 76 RED/BLACK
PIN 11 - 77 BLUE/BLACK
PIN 12 - 78 BLACK/WHITE
PIN 13 - 79 GREEN
PIN 14 - 35C WHITE/BLACK
PIN 15 - 35C WHITE/BLACK
TO "ELECTRIC PANEL"
PIN 1 - 02 WHITE
PIN 2 - 35C WHITE/BLACK
PIN 3 - 70 GREEN/BLACK
PIN 4 - 70A RED/WHITE
PIN 5 - 71 ORANGE
PIN 6 - 72 RED
PIN 7 - 73 BLUE
PIN 8 - 74 BLACK
PIN 9 - 75 ORANGE/BLACK
PIN 10 - 76 RED/BLACK
PIN 11 - 77 BLUE/BLACK
PIN 12 - 78 BLACK/WHITE
PIN 13 - 79 GREEN
PIN 14 - 35C BLUE/WHITE
PIN 15 - 35C GREEN/WHITE
TO ELECTRIC PANEL
02 - WHITE
10A BLUE/WHITE
35 BROWN/RED
35C WHITE/BLACK
70 GREEN/BLACK
79 GREEN
35C BLUE/WHITE
35C GREEN/WHITE
35D PURPLE/WHITE
70A RED/WHITE
02 WHITE
TO "CONTROL BOX"
TEN PIN CONNECTOR PLUG
PIN 1 - 74 BLACK
PIN 2 - 73 BLUE
PIN 3 - 78 BLACK/WHITE
PIN 4 - 77 BLUE/BLACK
PIN 5 - 35D PURPLE/WHITE
PIN 6 - N/U
PIN 7 - 71 ORANGE
PIN 8 - 72 RED
PIN 9 - 75 ORANGE/BLACK
PIN 10 - 76 RED/BLACK
FRONT LEFT
FRONT RIGHT
REAR LEFT
REAR RIGHT
JUMPER
M50333AC_1

3.24 Powered Extension Platform - Electrical Wiring Diagram (Model 9250)



3.25 Horn, Light & Beeper Wiring Diagram (ANSI/CSA) (Model 9250)

A | B | C | D | E | F | G | H

V | W | X | Y | Z

DUAL FLASHING LIGHT OPTION

FL -22-1

FL-22-2

TO MAIN ELETRICAL PANEL

22

GREEN - 22
WHITE - 02

22 02

GREEN - 22
WHITE - 02

22 02

22 02

22 02

HORN, LIGHT & BEEPER

FL-22
LIGHT
00 - WHITE
22 - GREEN

BP - 29
BEEPER
29 - RED
00 - BLACK

22

00

00

29

H1 - HORN
00 - WHITE
49A - GREEN

TO MAIN ELECTRICAL PANEL

ROTATING AMBER BEACON OPTION

RL - 29
ROTATING BEACON
29 - RED

FASTEN THE “00” WIRES ON THIS
BOLT WITH HARDWARE SUPPLIED

BP - 29
BEEPER
29 - RED
00 - BLACK

00

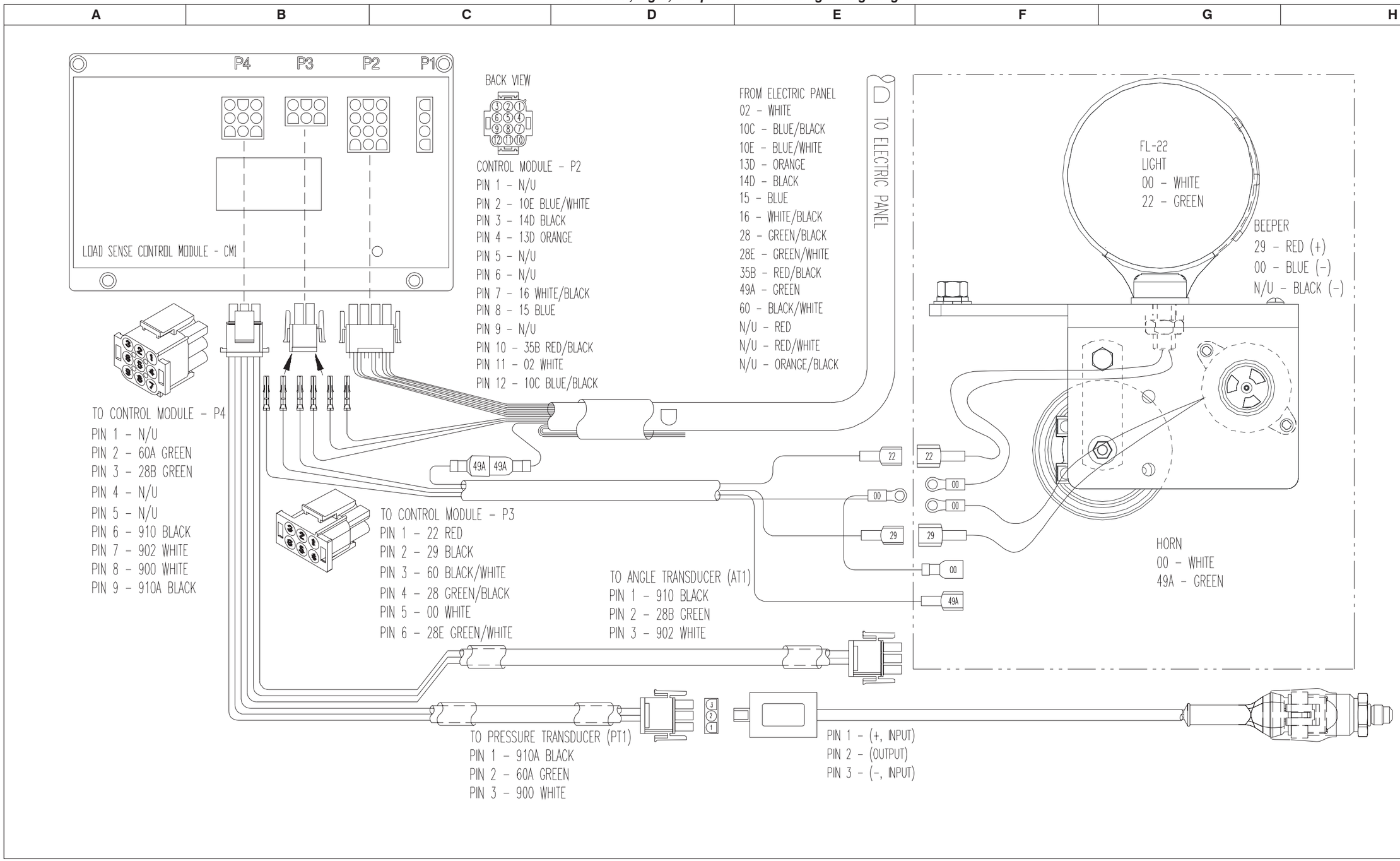
29

H1 - HORN
00 - WHITE
49A - GREEN

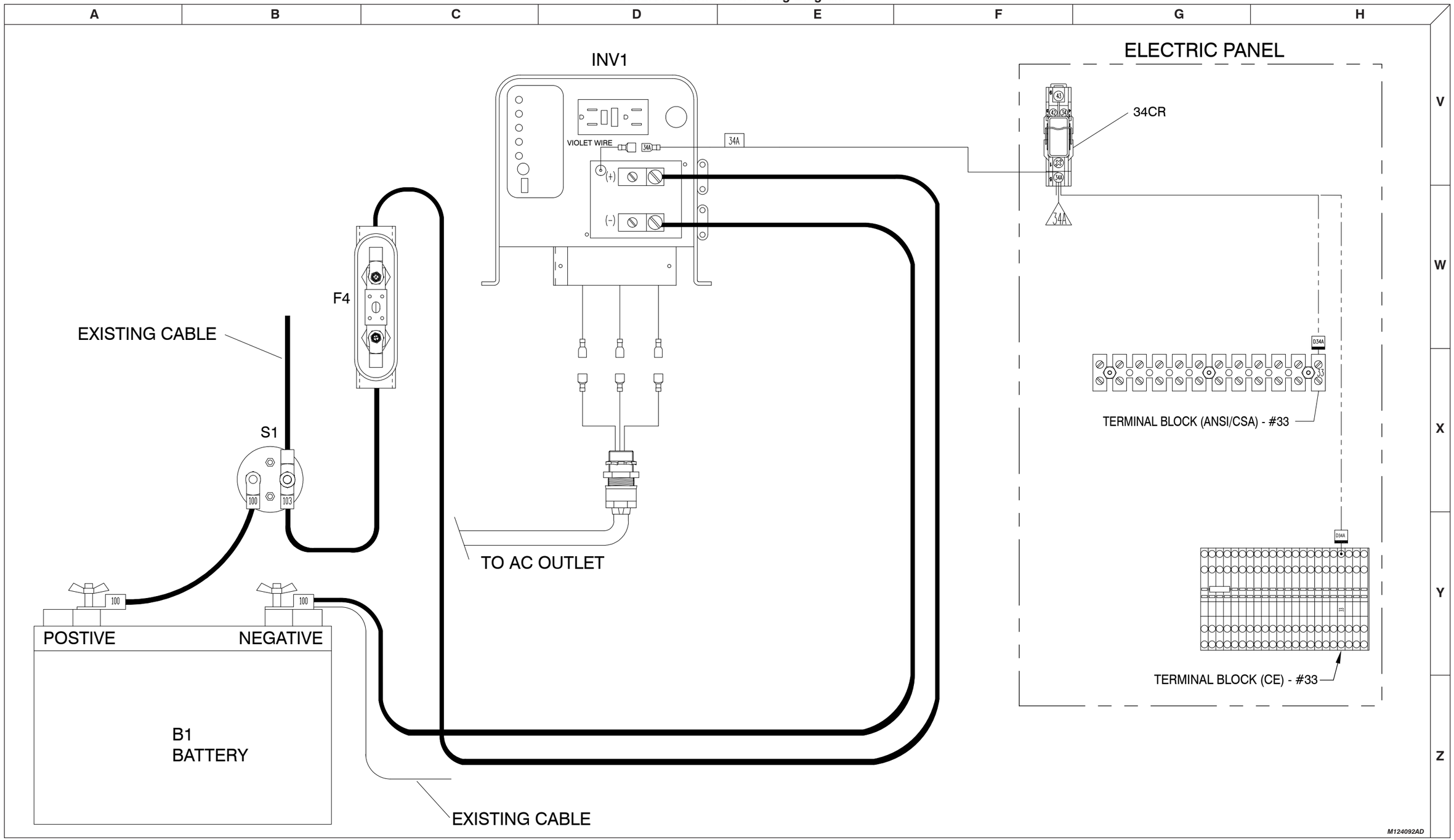
TO MAIN ELECTRICAL PANEL

M47681AA_S3

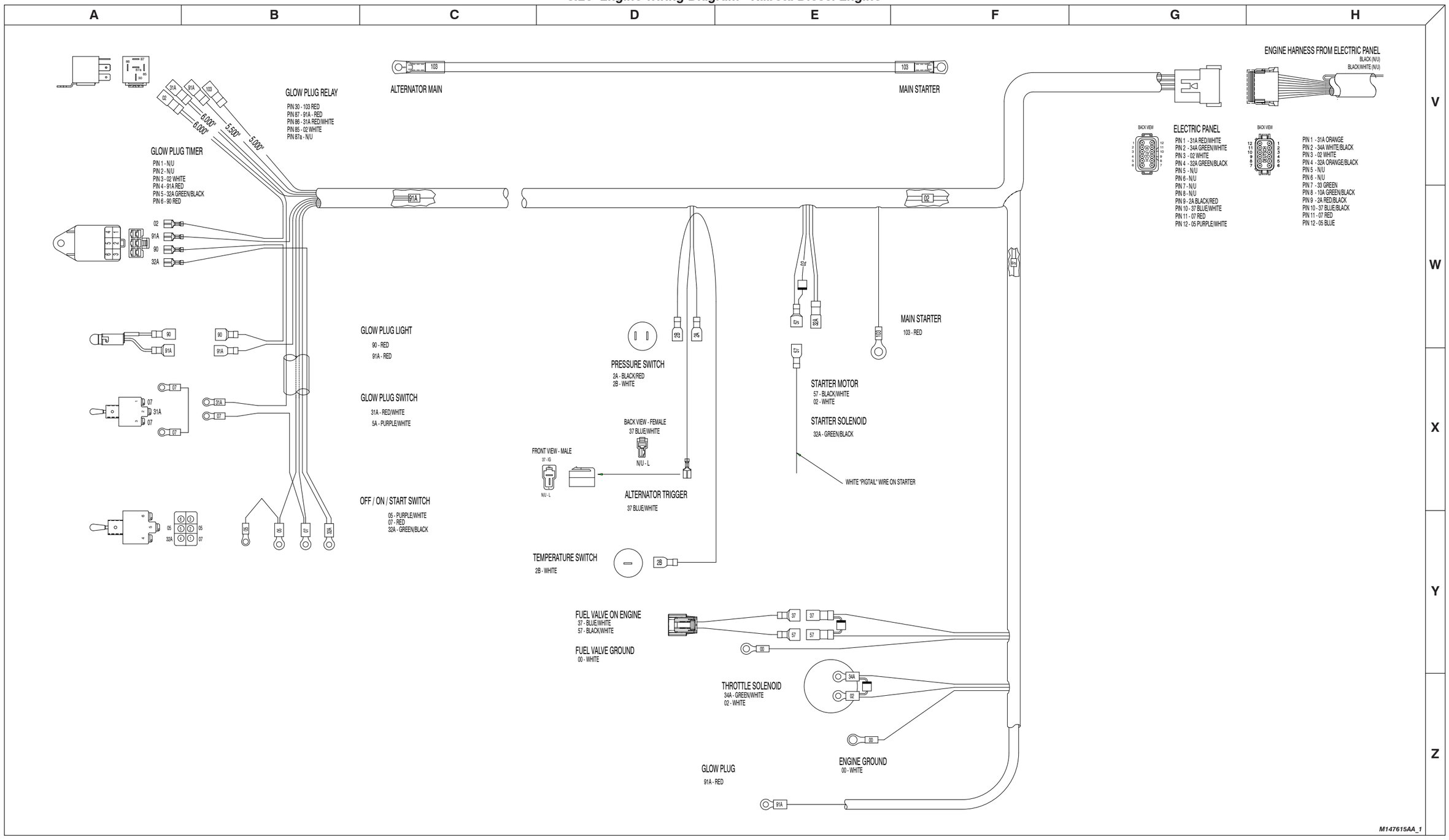
3.26 Horn, Light, Beeper & Load Sensing Wiring Diagram



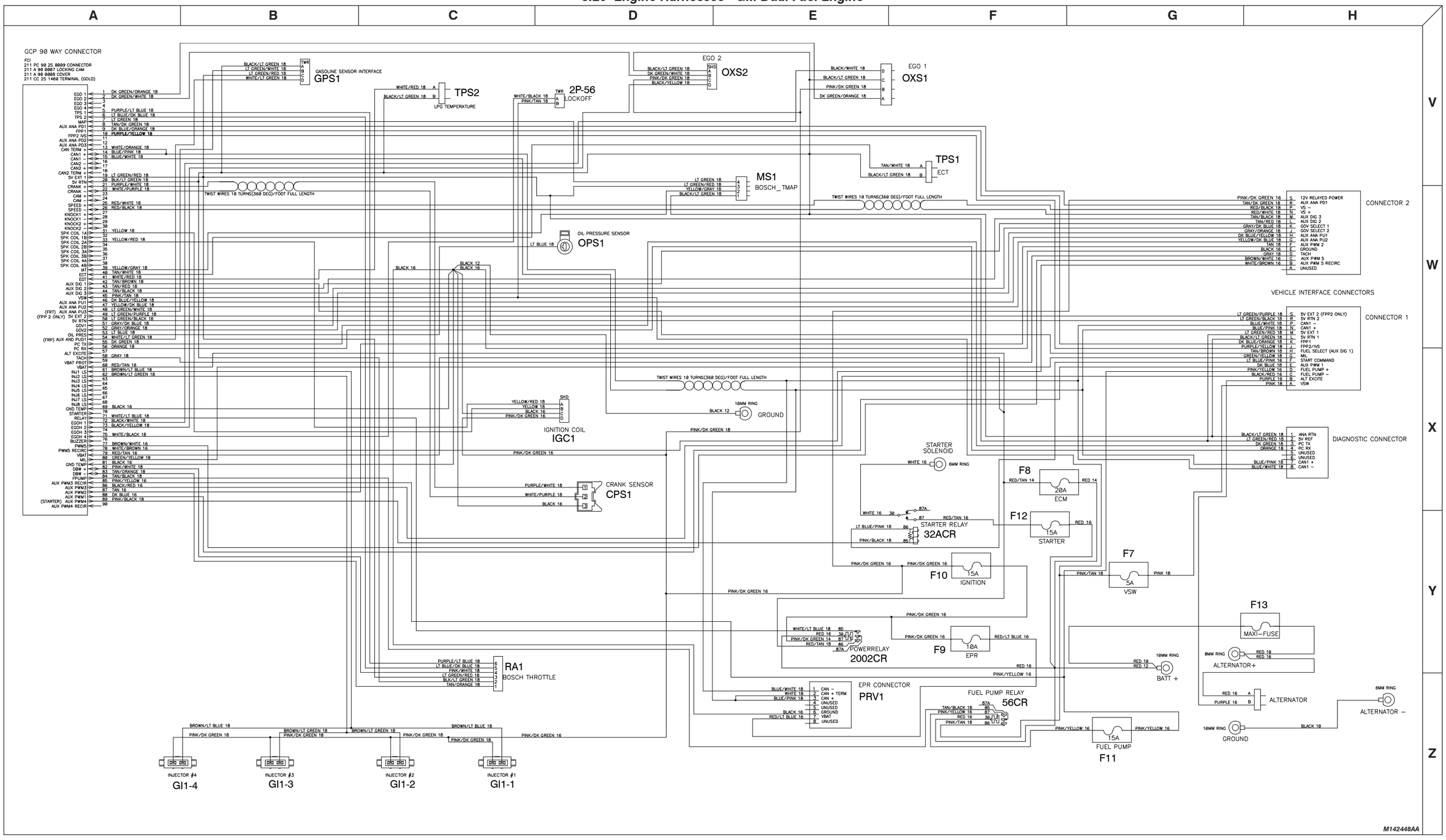
3.27 Electrical Inverter Wiring Diagram



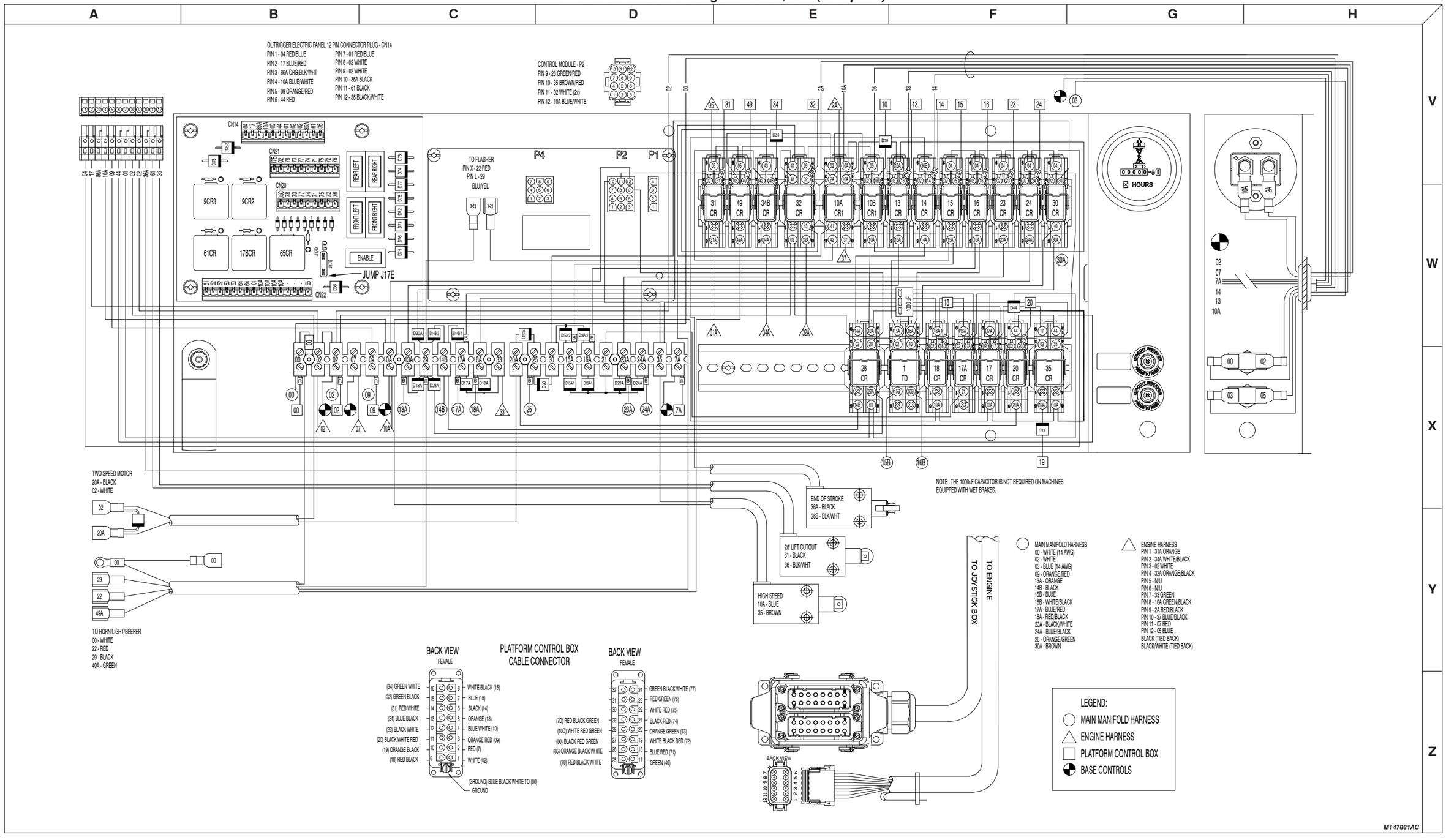
3.28 Engine Wiring Diagram - Kubota Diesel Engine



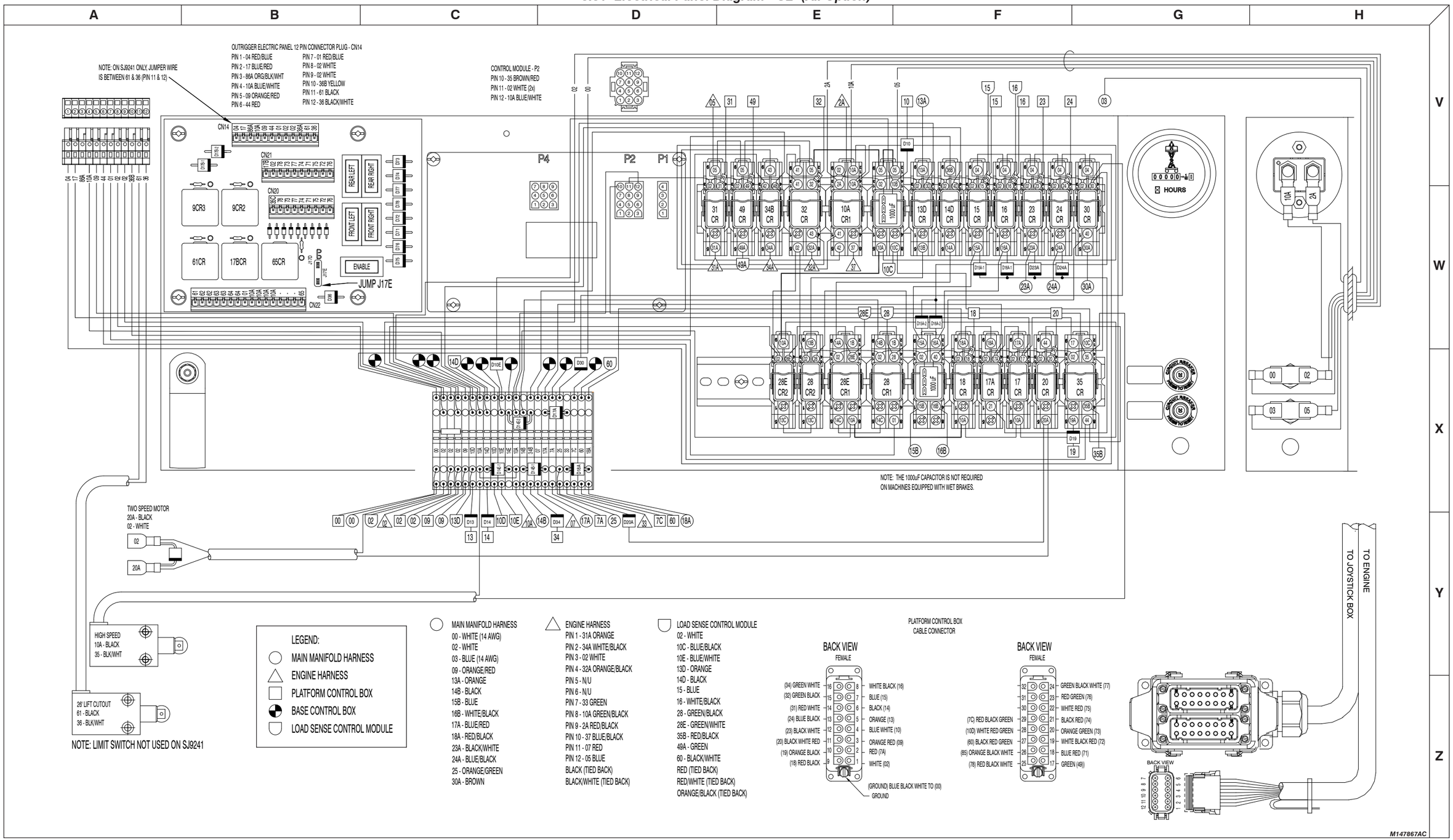
3.29 Engine Harnesses - GM Dual Fuel Engine



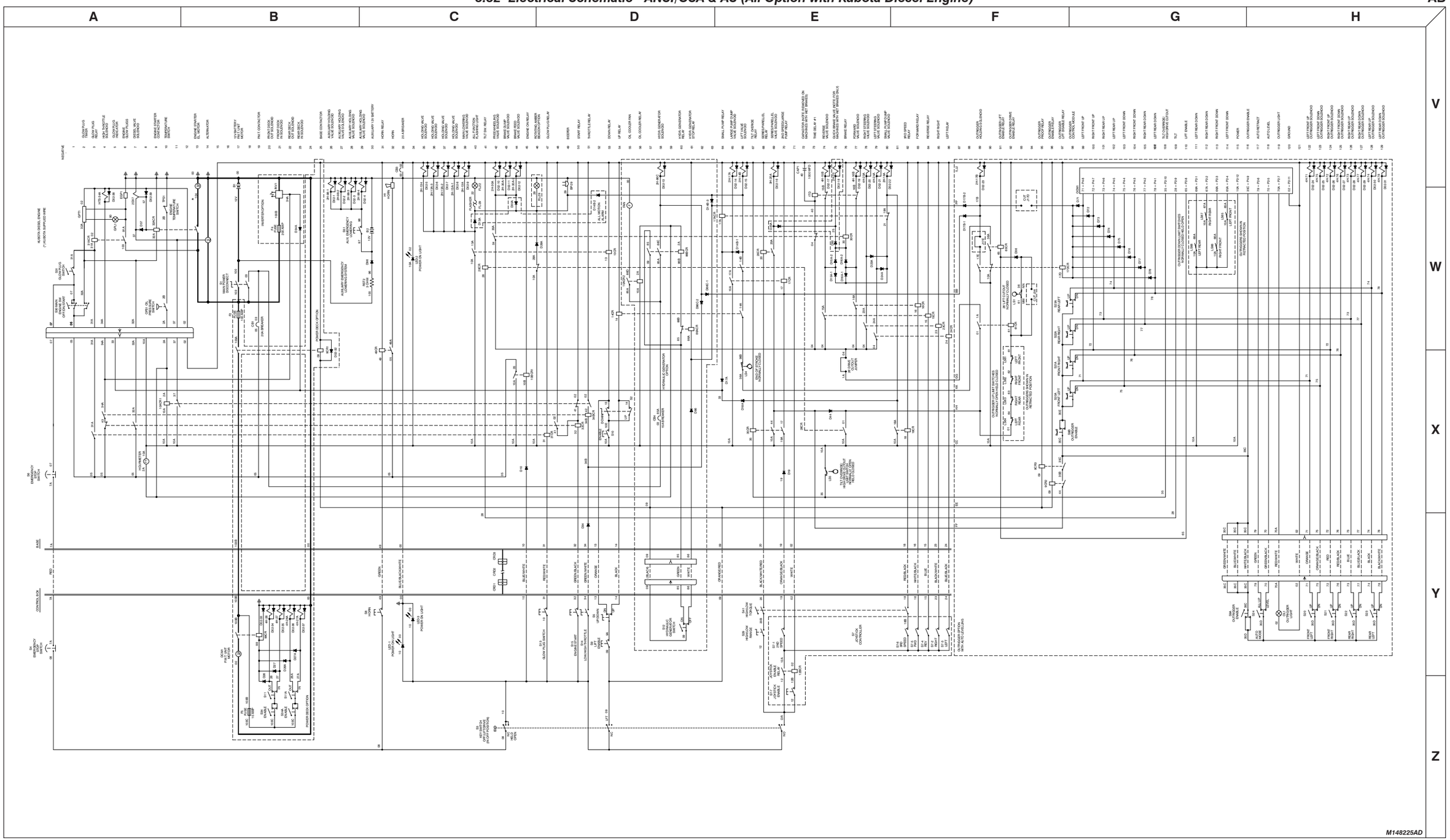
3.30 Electrical Panel Diagram - ANSI/CSA (All Option)



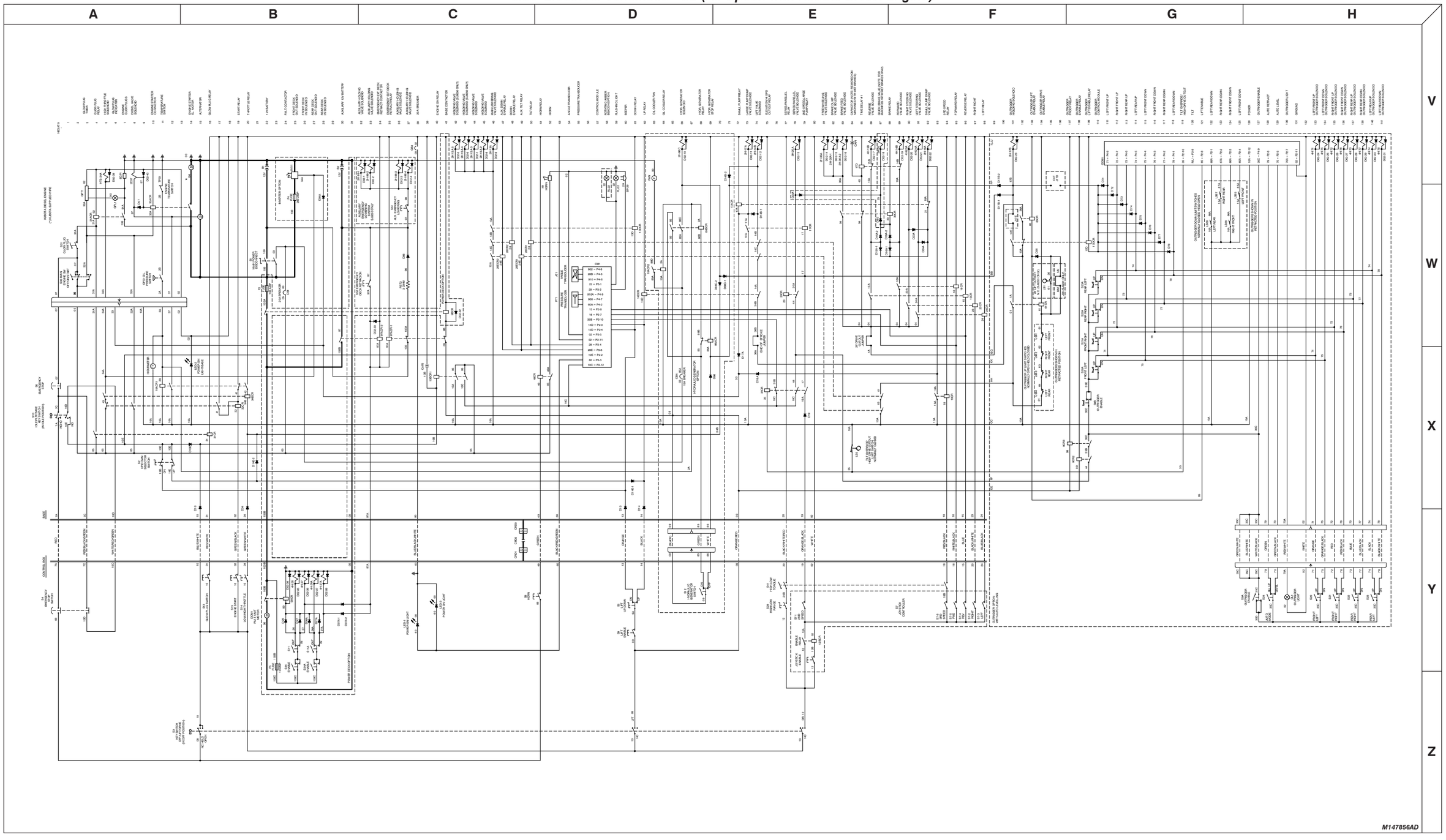
3.31 Electrical Panel Diagram - CE (All Option)



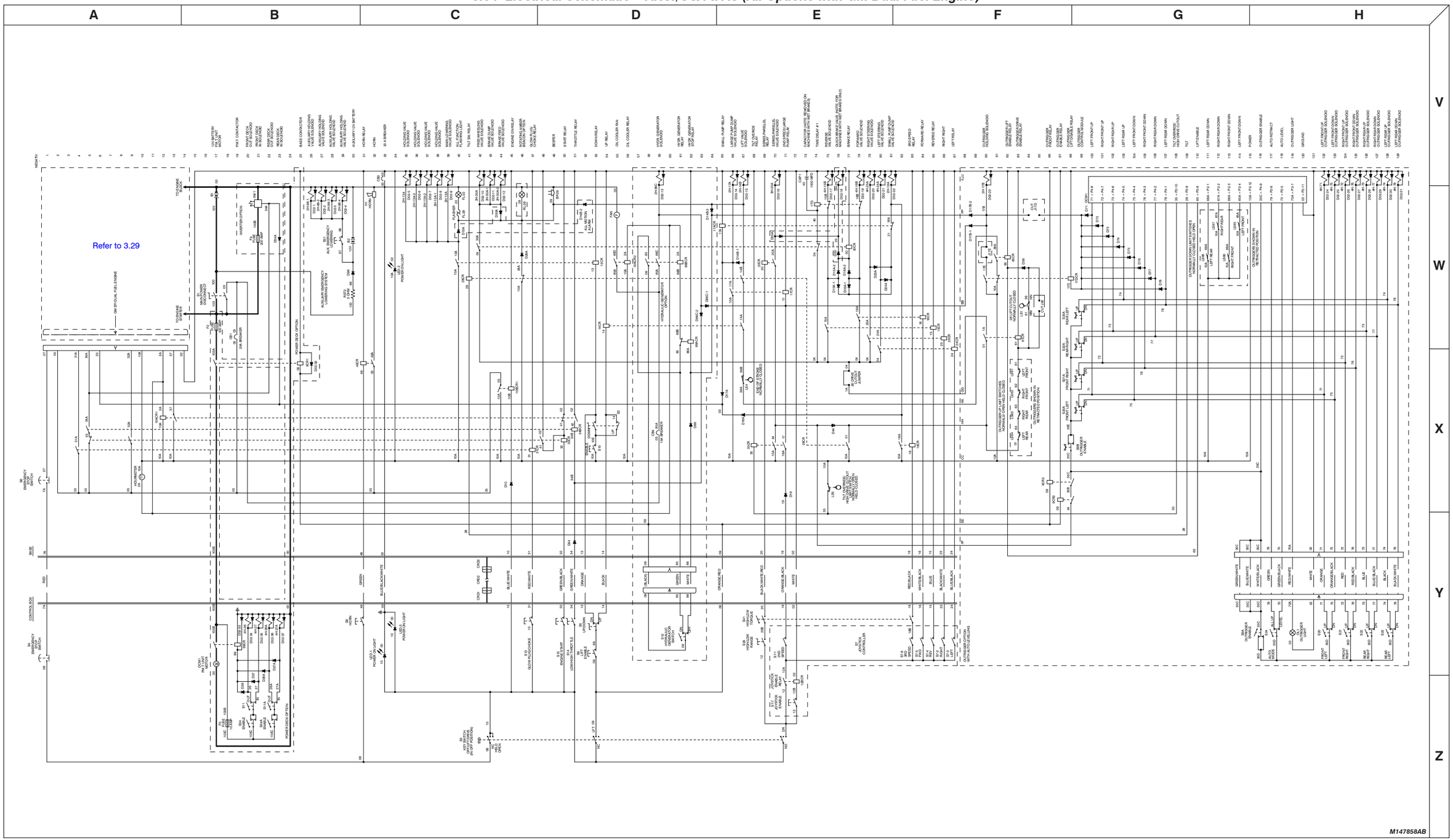
3.32 Electrical Schematic - ANSI/CSA & AS (All Option with Kubota Diesel Engine)



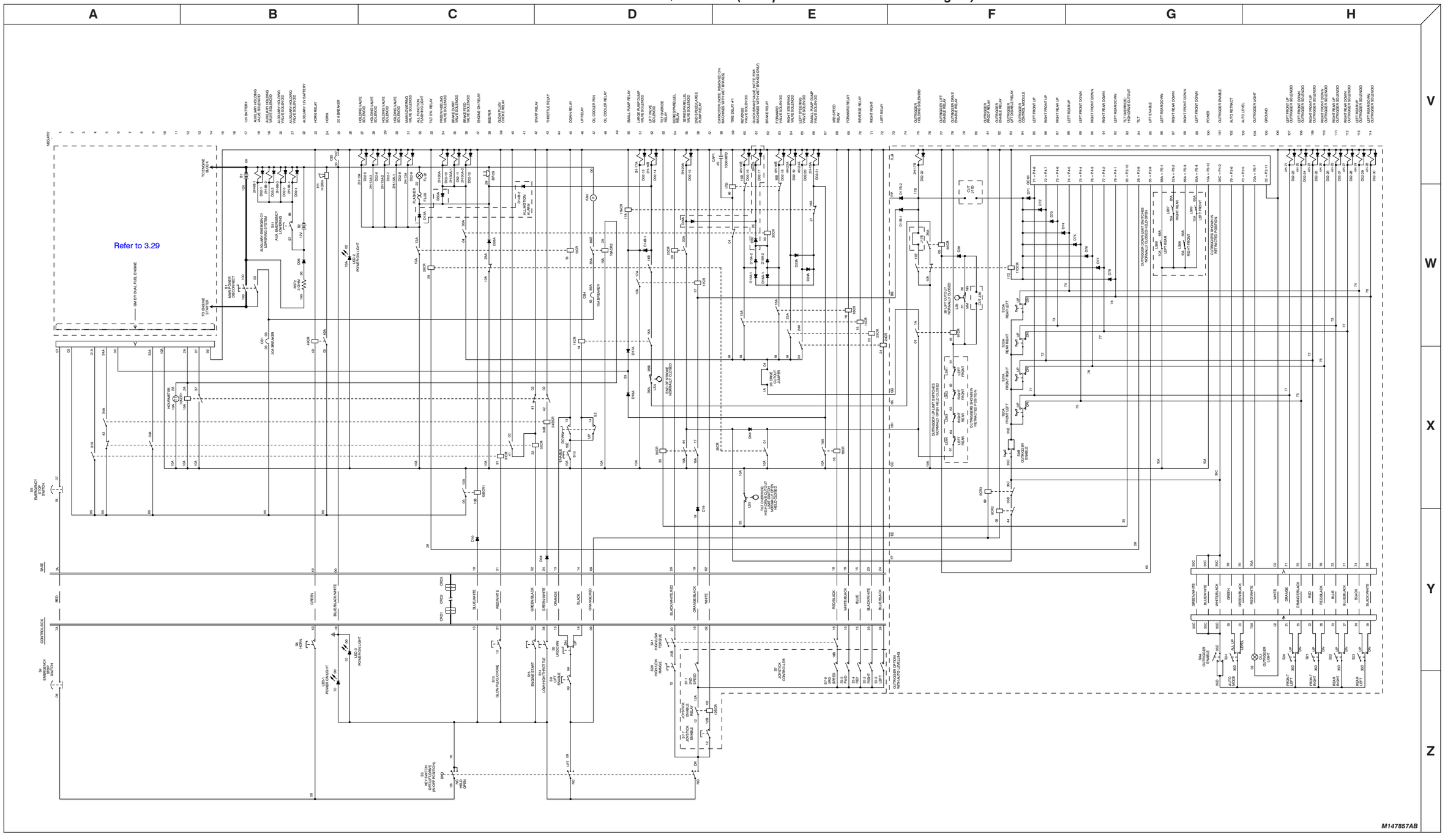
3.33 Electrical Schematic - CE (All Option with Kubota Diesel Engine)



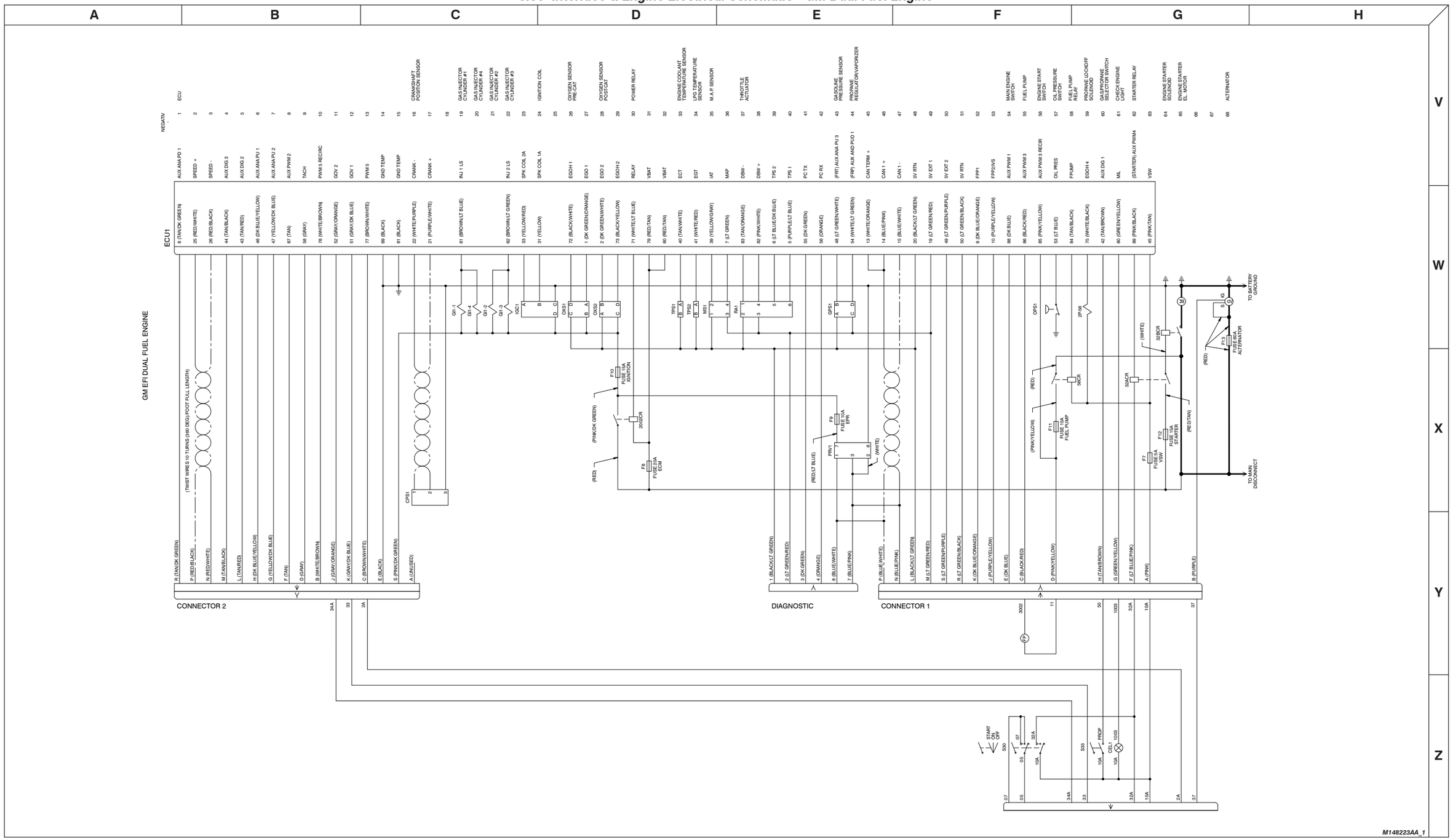
3.34 Electrical Schematic - ANSI/CSA & AS (All Options with GM Dual Fuel Engine)



3.35 Electrical Schematic - ANSI/CSA & AS (No Options with GM Dual Fuel Engine)



3.36 Interface & Engine Electrical Schematic - GM Dual Fuel Engine



Section 4
TROUBLESHOOTING INFORMATION

Table of Contents

Introduction 5

Electrical System

4.1-1 All Controls Inoperative 6
4.1-2 No Power to Platform (ANSI/CSA) 6
4.1-3 No Power to Platform (CE) 6
4.1-4 All Functions Inoperative from Platform 7
4.1-5 Engine will Not Crank from Platform 7
4.1-6 Engine will Not Crank from Platform Controls (Additional for GM Dual Fuel) 8
4.1-7 Engine will Not Crank from Base Controls (GM dual fuel) 9
4.1-8 Engine will Not Crank from Base Controls (Kubota diesel) 9
4.1-9 Engine Cranks but Stops Cranking after a few seconds 9
4.1-10 Glow Plugs Inoperative from Engine Controls 9
4.1-11 Glow Plugs Inoperative from Platform (Additional) 10
4.1-12 Engine Cranks but will Not Start (Kubota diesel) 10
4.1-13 Engine Cranks but will Not Start (GM dual fuel) 10
4.1-14 Mid Throttle Inoperative (on demand) (GM Dual Fuel) 12
4.1-15 High Throttle Inoperative 12
4.1-16 High Throttle Inoperative (additional for GM dual fuel) 13
4.1-17 Drive and Steer Inoperative 13
4.1-18 Brakes will Not Release 14
4.1-19 Steer Right Inoperative 15
4.1-20 Steer Left Inoperative 15
4.1-21 Reverse Drive Inoperative 16
4.1-22 Forward Drive Inoperative 16
4.1-23 First Drive Speed and Steering Inoperative 17
4.1-24 Second Drive Speed Inoperative 17
4.1-25 Third Drive Speed Inoperative 18
4.1-26 High/Low Range Speed Inoperative 19
4.1-27 Up Circuit Inoperative from Platform or Base 19
4.1-28 Platform will Not Lift from Platform or Base Controls with Outriggers Extended 20
4.1-29 Platform will Not Lift from Platform or Base Controls with Outriggers Retracted (lift operates correctly with outriggers extended) 22
4.1-30 Up Circuit Inoperative from Base (ANSI/CSA) 22
4.1-31 Up Circuit Inoperative from Base (CE) 22
4.1-32 Down Circuit Inoperative from Platform or Base 23
4.1-33 Down Circuit Inoperative from Base (ANSI/CSA) 24
4.1-34 Down Circuit Inoperative from Base (CE) 24
4.1-35 Powered Extension Platform Inoperative 25
4.1-36 Powered Extension Platform will Not Extend 25
4.1-37 Powered Extension Platform will Not Retract 26
4.1-38 Hydraulic Generator Inoperative 26
4.1-39 Hydraulic Generator will Not Shut Off from Generator Switch 27
4.1-40 All Outriggers Inoperative (Auto-level and manual) 27
4.1-41 All Outriggers Inoperative (Auto-level and manual from platform controls) 28

4

Table of Contents (Continued)

4.1-43 All Outriggers Inoperative (Auto-level)
A: Led Power Indicator Light at Outrigger Control Module (OCM1) Not on Constant 28
4.1-44 All Outriggers Inoperative (Auto Level)
B: Led Power Indicator Light at Outrigger Control Module (OCM1) Flashing 29
4.1-45 Left Front Outrigger Inoperative Manually 30
4.1-46 Right Front Outrigger Inoperative Manually 30
4.1-47 Right Rear Outriggers Inoperative Manually 30
4.1-48 Left Rear Outriggers Inoperative Manually 31
4.1-49 Individual Outrigger Functions Inoperative (auto-level) 31
4.1-50 Auto-level Inoperative 31
4.1-51 Auto All Up Inoperative (Retract) 32

Hydraulic System

4.2-1 All Functions Inoperative 33
4.2-2 Steering Inoperative 33
4.2-3 Steer and First Drive Speed Inoperative 33
4.2-4 Lift and Second Drive Speed Inoperative 33
4.2-5 Drive Inoperative 33
4.2-6 Reverse Drive Inoperative 34
4.2-7 Forward Drive Inoperative 34
4.2-8 Brakes will Not Release 34
4.2-9 Brakes will Not Release (Internal Brake) 34
4.2-10 Brake Slips (Internal Brake) 34
4.2-11 Brake Drags or Runs Hot (Internal Brake) 35
4.2-12 Up Circuit Inoperative 35
4.2-13 Down Circuit Inoperative 35
4.2-14 Powered Extension Platform Inoperative 35
4.2-15 Hydraulic Generator Inoperative 36
4.2-16 All Outriggers Inoperative 36
4.2-17 Left Front Outrigger Inoperative 36
4.2-18 Right Front Outrigger Inoperative 36
4.2-19 Right Rear Outrigger Inoperative 36
4.2-20 Left Rear Outrigger Inoperative 36
4.2-21 Outriggers Drift In 36

Load Sensing System

4.3-1 Flash Code F01: Check HWFS 37
4.3-2 Flash Code F02: Not Ground Mode 37
4.3-3 Flash Code F03: Not Stopped 37
4.3-4 Flash Code F04: Tilted 37
4.3-5 Flash Code F05: Bad Height 37
4.3-6 Flash Code F06: Check Elev 37
4.3-7 Flash Code F08: Check Elev 37
4.3-8 Flash Code F09: Bad Height 37
4.3-9 Flash Code F10: Bad Height 37
4.3-10 Flash Code F11: Not Up 37

Table of Contents (Continued)

4.3-11 Flash Code F12: Too Many....38
4.3-12 Flash Code F13: Low Height Range....38
4.3-13 Flash Code F14: Bad Height....38
4.3-14 Flash Code F15: Check Elev....38
4.3-15 Flash Code F16: Low Elev.open....38
4.3-16 Flash Code F17: High Elev.open....38
4.3-17 Flash Code F18: Low Elev.close....38
4.3-18 Flash Code F19: High Elev.close....39
4.3-19 Flash Code F20: Height<>0%....39
4.3-20 Flash Code F21: Height<>0%....39
4.3-21 Flash Code F22: Height<>100%....39
4.3-22 Flash Code F23: Height<>100%....39
4.3-23 Flash Code F24: Too Many....39
4.3-24 Flash Code F25: Check Elev....39
4.3-25 Flash Code F26: Check Elev....39
4.3-26 Flash Code F27: Bad Height....40
4.3-27 Flash Code F30: Bad Heights....40
4.3-28 Flash Code F31: Reject Curve....40
4.3-29 Flash Code F32: Reject Curve....40
4.3-30 Flash Code F33: Reject Curve....40
4.3-31 Flash Code F34: Reject Curve....40
4.3-32 Flash Code F40: Reject Delta....40
4.3-33 Flash Code F42: Low Pressure....41
4.3-34 Flash Code F43: High Pressure....41
4.3-35 Flash Code F44: Low Pressure....41
4.3-36 Flash Code F45: High Pressure....41
4.3-37 Flash Code F46: Check Elev....41
4.3-38 Flash Code F47: Check Elev....41

Introduction

The following pages contain a table of Troubleshooting Information for locating and correcting most service trouble which can develop. Careful and accurate analysis of the systems listed in the table of Troubleshooting Information will localize the trouble more quickly than any other method. This manual cannot cover all possible troubles and deficiencies that may occur. If a specific trouble is not listed, isolate the major component in which the trouble occurs, isolate whether the problem is electrical or hydraulic, and then isolate and correct the specific problem.

The content of this section is separated into “probable cause” and “remedy.” The information preceded by a number represents the “probable cause.” The following line, noted by a dash represents the “remedy” to the “probable cause” directly above it. See example below for clarification.

1. Probable Cause
   - Remedy

Electrical System

4.1-1 All Controls Inoperative

1. Battery disconnected or discharged.
   - Reconnect battery. Recharge if discharged.
2. Loose or dirty battery cables.
   - Clean and tighten battery cables.
3. Open or defective main power disconnect switch S1.
   - Close switch. Replace if defective.
4. Loose or broken wire #03 from main power disconnect switch S1 to circuit breaker CB1.
   - Check continuity. Replace if defective.
5. Tripped or defective circuit breaker CB1.
   - Reset breaker. Check for defective wiring. Replace breaker if defective.
6. Loose or broken wire #05 from breaker CB1 to relay 10BCR1.
   - Check continuity. Replace if defective.
7. Loose or broken wire #05 from relay 31CR to base engine switch S30.
   - Check continuity. Replace if defective.
8. Loose or broken wire #00 from battery B1 to base terminal block TB-1.
   - Check continuity. Replace if defective.
9. Loose or broken wire #00 from base terminal block TB-1 to circuit breaker CB3.
   - Check continuity. Replace if defective.
10. Tripped or defective circuit breaker CB3.
    - Reset breaker. Check for defective wiring. Replace breaker if defective.
11. Loose or broken wire #02 from circuit breaker CB3 to base terminal block TB-1.
    - Check continuity. Replace if defective.

4.1-2 No Power to Platform (ANSI/CSA)

1. Open or defective base engine switch S30.
   - Check switch. Replace if defective.
2. Loose or broken wire #07 from base engine switch S30 to base terminal block TB-1.
   - Check continuity. Replace if defective.
3. Loose or broken wire #07 from base terminal block TB-1 to emergency stop switch S6.
   - Check continuity. Replace if defective.
4. Open or defective emergency stop switch S6.
   - Check switch. Replace if defective.
5. Loose or broken wire #7A from emergency stop switch S6 to base terminal block TB-1.
   - Check continuity. Replace if defective.
6. Loose or broken wire #7A from base terminal block TB-1 to emergency stop switch S4.
   - Check continuity. Replace if defective.
7. Open or defective emergency stop switch S4.
   - Check switch. Replace if defective.

4.1-3 No Power to Platform (CE)

1. Open or defective base engine switch S30.
   - Check switch. Replace if defective.
2. Loose or broken wire #07 from engine start switch S30 to base terminal block TB-1.
   - Check continuity. Replace if defective.
3. Loose or broken wire #07 from base terminal block TB-1 to emergency stop switch S6.
   - Check continuity. Replace if defective.
4. Open or defective emergency stop switch S6.
   - Check switch. Replace if defective.

Electrical System (Continued)

5. Loose or broken wire #7C from emergency stop switch S6 to platform/base switch S10.
   - Check continuity. Replace if defective.
6. Open or defective platform/base switch S10.
   - Select platform on switch. Check switch. Replace if defective.
7. Loose or broken wire #7A from platform/base switch S10 to platform emergency stop switch S4.
   - Check continuity. Replace if defective.
8. Open or defective platform emergency stop switch S4.
   - Check switch. Replace if defective.

4.1-4 All Functions Inoperative from Platform

1. Loose or broken wire #08 from emergency stop switch S4 to off/lift/drive key switch S3.
   - Check continuity. Replace if defective.
2. Open or defective off/lift/drive key switch S3.
   - Check switch. Replace if defective.
3. Loose or broken wire #10 from off/lift/drive key switch S3 to platform terminal block.
   - Check continuity. Replace if defective.
4. Loose or broken wire #10 from platform terminal block to diode D10 located at relay 10BCR1.
   - Check continuity. Replace if defective.
5. Open diode D10 or diode D10 is not connected at relay 10BCR1.
   - Check diode. Replace if defective.

All Functions Inoperative (Additional for machines with Load Sensing System) (CE)

1. Loose or broken wire #10C from base terminal strip to control module CM1 at pin #P2-12.
   - Check for 12 Volts at P2-12. If no voltage present, check wire continuity. Replace if defective.
2. Loose or broken wire #28 from control module CM1 at pin #P3-4 to 28CR1 tilt relay and 28CR2 Down Enable Relay.
   - Check for 12 Volts at P3-4. If voltage present, check for 12 Volts at wire #28A on outrigger connector plug CN-14 at pin #1. If voltage present, check for 12 Volts on wire #28A at 28ACR1 Relay and 28ACR2 Relay. If voltage present, check operation of relays. If no voltage present, check wire continuity. Replace if defective.
3. Loose or broken wire #28E from control module CM1 at pin #P3-6 to 28ECR1 auxiliary tilt relay and 28ECR2 auxiliary down enable relay.
   - Check for 12 Volts at P3-6. If voltage present, check for 12 Volts at wire #28E at 28ECR1 and 28ECR2 relays. If voltage present, check operation of relays. If no voltage present, check wire continuity. Replace if defective.
4. Defective pressure transducer PT1 or angle transducer AT1 or related wiring.
   - Refer to transducer troubleshooting charts.

4.1-5 Engine will Not Crank from Platform

1. Open or defective key switch S3.
   - Check switch. Replace if defective.
2. Loose or broken wire #10 from key switch S3 to start switch S15.
   - Check continuity. Replace if defective.
3. Defective start switch S15.
   - Check switch. Replace if defective.
4. Loose or broken wire #32 from start switch S15 to relay 32CR.
   - Check continuity. Replace if defective.
5. Defective relay 32CR.
   - Check relay. Replace if defective.

Electrical System (Continued)

6. Loose or broken wire #41 from relay 32CR to relay 10ACR1.
   - Check continuity. Replace if defective.
7. Loose or broken wire #02 from relay 10ACR1 to base terminal block.
   - Check continuity. Replace if defective.
8. Loose or broken wire #05 from base terminal block to relay 32CR.
   - Check continuity. Replace if defective.
9. Loose or broken wire #32A from relay 32CR to starter contactor 32ACR.
   - Check continuity. Replace if defective.
10. Defective starter contactor 32ACR.
    - Check contactor. Replace if defective.
11. Loose or broken wire #00 from starter contactor 32ACR to engine ground.
    - Check continuity. Replace if defective.
12. Loose or broken wire #103 from main power disconnect switch S1 to starter contactor 32ACR. (Kubota Diesel)
    - Check continuity. Replace if defective.
13. Loose or broken wire #103 from main power disconnect switch S1 to starter contactor 32BCR. (GM Dual Fuel)
    - Check continuity. Replace if defective.
14. Loose or broken wire #104 from starter contactor 32ACR to starter motor. (Kubota Diesel)
    - Check continuity. Replace if defective.
15. Defective starter motor.
    - Check motor. Repair or replace if defective.

4.1-6 Engine will Not Crank from Platform Controls (Additional for GM Dual Fuel)

1. Loose or broken wire #10A from base terminal block TB1 to engine harness plug.
   - Check continuity. Replace if defective.
2. Loose or broken wire #10A from engine harness plug to GM engine connector 1.
   - Check continuity. Replace if defective.
3. Loose or broken pink wire from GM engine connector 1 to fuse F7.
   - Check continuity. Replace if defective.
4. Defective fuse F7.
   - Check fuse. Replace if defective
5. Loose or broken pink/tan wire from fuse F7 to ECU connector pin #45.
   - Check continuity. Replace if defective
6. Loose or broken red wire from battery positive to ECU fuse F8.
   - Check continuity. Replace if defective.
7. Defective fuse F8.
   - Check fuse. Replace if defective.
8. Loose or broken red/tan wire from fuse F8 to ECU connector pin #60 and pin #79.
   - Check continuity. Replace if defective.
9. Loose or broken black wire from engine ground to ECU connector pin #69 and #81.
   - Check continuity. Replace if defective.
10. Loose or broken light blue/pink wire from GM engine connector 1 to relay 32ACR.
    - Check continuity. Replace if defective.
11. Loose or broken pink/black wire from ECU connector pin #89 to relay 32ACR.
    - Check continuity. Replace if defective.
12. Defective relay 32ACR.
    - Check relay. Replace if defective.
13. Loose or broken red wire from battery positive to starter fuse F12.
    - Check continuity. Replace if defective.

Electrical System (Continued)

14. Defective fuse F12.
    - Check fuse. Replace if defective.
15. Loose or broken red/tan wire from fuse F12 to relay 32ACR.
    - Check continuity. Replace if defective.
16. Loose or broken white wire from relay 32ACR to start solenoid 32BCR.
    - Check continuity. Replace if defective.
17. Defective starter solenoid 32BCR.
    - Check solenoid. Replace if defective.
18. Loose or broken battery cable from starter solenoid 32BCR to starter motor.
    - Check continuity. Replace if defective.
19. Defective starter motor.
    - Check motor. Repair or replace if defective.

4.1-7 Engine will Not Crank from Base Controls (GM dual fuel)

1. Loose or broken wire #10A from base terminal block TB1 to engine harness plug.
    - Check continuity. Replace if defective.
2. Loose or broken wire #10A from engine harness plug to base start switch S30.
    - Check continuity. Replace if defective.
3. Defective base start switch S30.
    - Check switch. Replace if defective.
4. Loose or broken wire #32A from base start switch S30 to GM engine connector 1.
    - Check continuity. Replace if defective.

4.1-8 Engine will Not Crank from Base Controls (Kubota diesel)

1. Loose or broken wire #05 from base terminal block to base engine switch S30.
    - Check continuity. Replace if defective.
2. Loose or broken jumper wire #05 on base engine switch S30.
    - Check continuity. Replace if defective.
3. Defective engine start switch S30.
    - Check switch. Replace if defective.
4. Loose or broken wire #32A from engine start switch S30 to starter contactor 32ACR.
    - Check continuity. Replace if defective.

4.1-9 Engine Cranks but Stops Cranking after a few seconds

1. Loose or broken jumper wire #41 on relay 32CR.
    - Check continuity. Replace if defective.
2. Loose or broken wire #02 from relay 32CR to base terminal block TB-1.
    - Check continuity. Replace if defective.

4.1-10 Glow Plugs Inoperative from Engine Controls

1. Loose or broken wire #07 from engine start switch S30 to glow plug switch S31.
    - Check continuity. Replace if defective.
2. Defective glow plug switch S31.
    - Check switch. Replace if defective.
3. Loose or broken wire #31A from glow plug switch S31 to glow plug relay 31ACR.
    - Check continuity. Replace if defective.
4. Loose or broken wire #02 from glow plug relay 31ACR to base terminal block TB1.
    - Check continuity. Replace if defective.
5. Loose or broken wire #103 from starter solenoid 32ACR to relay 31ACR.
    - Check continuity. Replace if defective.

Electrical System (Continued)

6. Loose or broken wire #91A from relay 31ACR to engine glow plugs EGP1.
   - Check continuity. Replace if defective.
7. Defective glow plug relay 31ACR.
   - Check relay. Replace if defective.
8. Defective glow plugs.
   - Check glow plugs. Replace if defective.

4.1-11 Glow Plugs Inoperative from Platform (Additional)

1. Loose or broken wire #10 from key selector switch S3 to glow plug switch S13.
   - Check continuity. Replace if defective.
2. Defective glow plug switch S13.
   - Check switch. Replace if defective.
3. Loose or broken wire #31 from glow plug switch S13 to glow plug relay 31CR.
   - Check continuity. Replace if defective.
4. Loose or broken wire #02 from relay 31CR to base terminal block TB1.
   - Check continuity. Replace if defective.
5. Loose or broken wire #05 from base terminal block TB1 to relay 31CR.
   - Check continuity. Replace if defective.
6. Loose or broken wire #31A from relay 31CR to glow plug relay 31ACR.
   - Check continuity. Replace if defective.
7. Defective relay 31CR.
   - Check relay. Replace if defective.

4.1-12 Engine Cranks but will Not Start (Kubota diesel)

1. Loose or broken wire #37 from base terminal block to diesel valve solenoid 2D37.
   - Check continuity. Replace if defective.
2. Loose or broken wire #57 from starter contactor 32ACR to diesel valve solenoid 2D37.
   - Check continuity. Replace if defective.
3. Defective fuel valve solenoid 2D37.
   - Check solenoid. Replace if defective.
4. Defective glow plug circuit.
   - See glow plugs inoperative above. Repair if necessary.

4.1-13 Engine Cranks but will Not Start (GM dual fuel)

NOTE

For additional engine troubleshooting refer to diagnostic trouble codes for use with the check engine light.

1. Loose or broken red wire from battery positive to relay 2002CR.
   - Check continuity. Replace if defective.
2. Loose or broken red/tan wire from ECU fuse F8 to relay 2002CR.
   - Check continuity. Replace if defective.
3. Loose or broken white/ light blue wire from ECU connector pin #71 to relay 2002CR.
   - Check continuity. Replace if defective.
4. Defective relay 2002CR.
   - Check relay. Replace if defective.
5. Loose or broken pink/dark green wire from relay 2002CR to ignition fuse F10.
   - Check continuity. Replace if defective

Electrical System (Continued)

6. Defective fuse F10.
   - Check fuse. Replace if defective
7. Loose or broken pink/dark green wire from fuse F10 to ignition coil IGC1 pin #D.
   - Check continuity. Replace if defective.
8. Loose or broken black wire from ignition coil IGC1 pin #C to engine ground.
   - Check continuity. Replace if defective.
9. Defective ignition coil IGC1.
   - Refer to section 5 of this manual for Ohm specifications. Replace if defective.
10. Loose or broken pink/dark green wire from fuse F10 to gas injectors GI-1, GI-2, GI-3 and GI-4.
    - Check continuity. Replace if defective.
11. Loose or broken pink/white wire from ECU connector pin #82 to throttle actuator RA1.
    - Check continuity. Replace if defective.
12. Loose or broken tan/orange wire from ECU connector pin #83 to throttle actuator RA1.
    - Check continuity. Replace if defective.
13. Loose or broken light green/red wire from ECU connector pin #19 to throttle actuator RA1.
    - Check continuity. Replace if defective.
14. Loose or broken black/light green wire from ECU connector pin #20 to throttle actuator RA1.
    - Check continuity. Replace if defective.
15. Loose or broken light blue/dark blue wire from ECU connector pin #6 to throttle actuator RA1.
    - Check continuity. Replace if defective.

FUEL RELATED PROBLEMS
(GASOLINE ONLY)

16. Loose or broken pink/tan wire from fuse F7 to fuel pump relay 56CR.
    - Check continuity. Replace if defective.
17. Loose or broken red wire from battery positive to fuel pump relay 56CR.
    - Check continuity. Replace if defective.
18. Loose or broken tan/black wire from ECU connector pin #42 to fuel pump relay 56CR.
    - Check continuity. Replace if defective.
19. Defective fuel pump relay 56CR.
    - Check relay. Replace if defective.
20. Loose or broken pink/yellow wire from fuel pump relay 56CR to fuse F11.
    - Check continuity. Replace if defective.
21. Defective fuse F11.
    - Check fuse. Replace if defective.
22. Loose or broken pink/yellow wire from fuse F11 to fuel pump FP.
    - Check continuity. Replace if defective.
23. Loose or broken pink/yellow wire from fuse F11 to ECU connector pin #85.
    - Check continuity. Replace if defective
24. Defective fuel pump FP.
    - Check fuel pump by putting 12 volts and a ground to it. Replace if defective.
25. Loose or broken wire #3002 from fuel pump FP to GM engine connector 1.
    - Check continuity. Replace if defective.
26. Loose or broken black/red wire from GM engine connector to ECU connector pin #86.
    - Check continuity. Replace if defective.

Electrical System (Continued)

(PROPANE ONLY)

NOTE

The fuel select switch is defaulted to gasoline. The engine will run on gasoline if propane is selected from the switch and either the switch is bad or a wire is loose or broken from the switch. This is providing there is nothing wrong on the gasoline side of the system. Disconnect fuel pump to test propane side.

27. Loose or broken wire #10A from engine harness plug to fuel select switch S33.
    - Check continuity. Replace if defective.
28. Defective fuel select switch S33.
    - Check switch. Replace if defective.
29. Loose or broken wire #50 from fuel select switch S33 to GM engine connector 1.
    - Check continuity. Replace if defective.
30. Loose or broken tan/brown wire from GM engine connector 1 to ECU connector pin #42.
    - Check continuity. Replace if defective.
31. Loose or broken pink/tan wire from fuse F7 to propane lock off 2P-56.
    - Check continuity. Replace if defective.
32. Loose or broken white/black wire from ECU connector pin #75 to propane lock off 2P-56.
    - Check continuity. Replace if defective.
33. Defective propane lock off 2P-56.
    - Check lock off. Replace if defective.
34. Loose or broken pink/dark green wire from fuse F10 to fuse F9.
    - Check continuity. Replace if defective.
35. Defective fuse F9.
    - Check fuse. Replace if defective.
36. Loose or broken red/light blue wire from fuse F9 to propane regulator PRV1.
    - Check continuity. Replace if defective.
37. Loose or broken black wire from engine ground to propane regulator PRV1.
    - Check continuity. Replace if defective.

4.1-14 Mid Throttle Inoperative (on demand) (GM Dual Fuel)

1. Open diode D17A or D18A.
    - Check diode. Replace if defective
2. Loose or broken wire #33 from base terminal block TB1 to engine harness plug.
    - Check continuity. Replace if defective.
3. Loose or broken wire #33 from engine harness plug to GM engine connector 2.
    - Check continuity. Replace if defective.
4. Loose or broken gray/dark blue wire from GM engine connector to ECU connector pin #51.
    - Check continuity. Replace if defective.
5. Loose or broken purple/light blue wire from ECU connector pin #5 to throttle actuator RA1.
    - Check continuity. Replace if defective.

4.1-15 High Throttle Inoperative

1. Loose or broken wire #10 from key switch S3 to high/low throttle switch S14.
    - Check continuity. Replace if defective.
2. Defective high/low throttle switch S14.
    - Check switch. Replace if defective.

Electrical System (Continued)

3. Loose or broken wire #34 from high/low throttle switch S14 to diode D34 at relay 34BCR. (ANSI/CSA only)
   - Check continuity. Replace if defective.
4. Loose or broken wire #34 from high/low throttle switch S14 to diode D34 at base terminal block TB-1. (CE only)
   - Check continuity. Replace if defective.
5. Open or loose diode D34.
   - Check diode. Replace if defective.
6. Loose or broken wire #34B from base terminal block TB-1 to relay 34BCR. (CE only)
   - Check continuity. Replace if defective.
7. Defective relay 34BCR.
   - Check relay. Replace if defective.
8. Loose or broken wire #42 from relay 34BCR to relay 10ACR1.
   - Check continuity. Replace if defective.
9. Defective relay 10ACR1.
   - Check relay. Replace if defective.
10. Loose or broken wire #02 from relay 10ACR1 to base terminal block TB1.
    - Check continuity. Replace if defective.
11. Loose or broken wire #05 from base terminal block TB1 to relay 32CR.
    - Check continuity. Replace if defective.
12. Defective relay 32CR.
    - Check relay. Replace if defective.
13. Loose or broken wire #43 from relay 32CR to relay 34BCR.
    - Check continuity. Replace if defective.
14. Loose or broken wire #34A from relay 34BCR to engine harness plug.
    - Check continuity. Replace if defective.
15. Loose or broken wire #34A from engine harness plug to high throttle solenoid HTS-34A. (Kubota Diesel)
    - Check continuity. Replace if defective.

4.1-16 High Throttle Inoperative (additional for GM dual fuel)

1. Loose or broken wire #34A from engine harness plug to GM engine connector 2.
   - Check continuity. Replace if defective.
2. Loose or broken gray/orange wire from GM engine connector 2 to ECU connector pin #52.
   - Check continuity. Replace if defective.
3. Loose or broken light blue/dark blue wire from ECU connector pin #6 to throttle actuator RA1.
   - Check continuity. Replace if defective.
4. Defective throttle actuator RA1.
   - Check actuator. Replace if defective.

4.1-17 Drive and Steer Inoperative

1. Outriggers not fully retracted
   - Fully retract outrigger cylinders
2. Key switch S3 in lift position.
   - Turn switch to drive position.
3. Defective drive contacts in key switch S3.
   - Check contacts. Replace if defective.
4. Loose or broken wire #12 from key switch S3 to joystick enable switch S7-7.
   - Check continuity. Replace if defective.

Electrical System (Continued)

5. Defective joystick enable switch S7-7.
   - Check switch. Replace if defective.
6. Loose or broken wire #12A from joystick enable relay 12BCR to speed, steer and direction switches S7-1 to S7-6.
   - Check continuity. Replace if defective.
7. Loose or broken wire #12B from joystick enable switch S7-7 to joystick enable relay 12BCR.
   - Check continuity. Replace if defective.
8. Defective joystick enable relay 12BCR.
   - Check continuity. Replace if defective.
9. Loose or broken wire #02 from joystick enable relay 12BCR to controller harness.
   - Check continuity. Replace if defective.
10. Loose or broken wire #10A from base terminal block to relay 28CR (ANSI/CSA) or relay 28ECR1 (CE).
    - Check continuity. Replace if defective.
11. Defective relay 28CR (ANSI/CSA) or relay 28ECR1 (CE).
    - Check relay. Replace if defective.
12. Loose or broken wire #1B from relay 28ECR1 to relay 28CR1. (CE only)
    - Check continuity. Replace if defective.
13. Defective relay 28CR1. (CE only)
    - Check relay. Replace if defective.
14. Loose or broken wire #1 from relay 28CR (ANSI/CSA) or 28CR1 (CE) to pin #7 on connector CN14 at the outrigger board.
    - Check continuity. Replace if defective.
15. Left rear outrigger limit switch LS64 is out of adjustment or defective.
    - Check continuity through switch. Adjust switch if out of adjustment. Replace if defective.
16. Right rear outrigger limit switch LS63 is out of adjustment or defective.
    - Check continuity through switch. Adjust switch if out of adjustment. Replace if defective.
17. Right front outrigger limit switch LS62 is out of adjustment or defective.
    - Check continuity through switch. Adjust switch if out of adjustment. Replace if defective.
18. Left front outrigger limit switch LS61 is out of adjustment or defective.
    - Check continuity through switch. Adjust switch if out of adjustment. Replace if defective.
19. Defective drive enable relay 61CR.
    - Check relay. Replace if defective.
20. Loose or broken wire #4 from pin #1 on connector CN14 at the outrigger board to relay 30CR.
    - Check continuity. Replace if defective.

4.1-18 Brakes will Not Release

1. Loose or broken wire #30 from diodes D15A-2 and D16A-2 to relay 30CR.
   - Check continuity. Replace if defective.
2. Defective relay 30CR.
   - Check relay. Replace if defective.
3. Loose or broken wire #02 from relay 30CR to base terminal block TB-1.
   - Check continuity. Replace if defective.
4. Loose or broken wire #4 from pin #1 on plug CN14 at outrigger board to relay 30CR.
   - Check continuity. Replace if defective.
5. Loose or broken wire #30A from relay 30CR to brake dump valve 2H-30A-1 or brake feed valve 2H-30A-2.
   - Check continuity. Replace if defective.
6. Defective valve coil brake dump 2H-30A-1 or brake feed 2H-30A-2.
   - Check continuity through coil. Replace if defective.

Electrical System (Continued)

7. Loose or broken wire #02 from valve coil brake dump 2H-30A-1 or brake feed 2H-30A-2 to base terminal block TB-1.
   - Check continuity. Replace if defective.
8. Loose or broken wire #30 from relay 30CR to diode D30 at base terminal block TB-1. (CE only)
   - Check continuity. Replace if defective.
9. Open diode D30.
   - Check diode. Replace if defective.
10. Loose or broken wire #25 from diode D30 to base terminal block TB-1. (Internal Brakes only)
    - Check continuity. Replace if defective.
11. Loose or broken wire #25 from base terminal block TB-1 to quick brake valve coil 2H-25. (Internal Brakes only)
    - Check continuity. Replace if defective.
12. Defective quick brake valve coil 2H-25. (Internal Brakes only)
    - Check continuity through coil. Replace if defective.
13. Loose or broken wire #02 from quick brake valve 2H-25 to base terminal block TB-1. (Internal Brakes only)
    - Check continuity. Replace if defective.

4.1-19 Steer Right Inoperative

1. Defective steer right switch S7-2 in joystick S7.
   - Check switch. Replace if defective.
2. Loose or broken wire #23 from steer right switch S7-2 to platform terminal block.
   - Check continuity. Replace if defective.
3. Loose or broken wire #23 from platform terminal block to relay 23CR.
   - Check continuity. Replace if defective.
4. Defective relay 23CR.
   - Check relay. Replace if defective.
5. Loose or broken wire #04 from base terminal block to relay 23CR.
   - Check continuity. Replace if defective.
6. Loose or broken wire #23A from relay 23CR to base terminal block.
   - Check continuity. Replace if defective.
7. Loose or broken wire #02 from relay 23CR to base terminal block.
   - Check continuity. Replace if defective.
8. Loose or broken wire #23A from base terminal block to steer right valve coil 4H-23A.
   - Check continuity. Replace if defective.
9. Defective steer right valve coil 4H-23A.
   - Check coil. Replace if defective.
10. Loose or broken wire #02 from steer right valve coil 4H-23A to base terminal block.
    - Check continuity. Replace if defective.
11. Open diode D23A.
    - Check diode. Replace if defective.

4.1-20 Steer Left Inoperative

1. Defective steer left switch S7-3 in joystick S7.
   - Check switch. Replace if defective.
2. Loose or broken wire #24 from steer left switch S7-3 to platform terminal block.
   - Check continuity. Replace if defective.
3. Loose or broken wire #24 from platform terminal block to relay 24CR.
   - Check continuity. Replace if defective.

Electrical System (Continued)

4. Defective relay 24CR.
   - Check relay. Replace if defective.
5. Loose or broken wire #04 from base terminal block to relay 24CR.
   - Check continuity. Replace if defective.
6. Loose or broken wire #24A from relay 24CR to base terminal block.
   - Check continuity. Replace if defective.
7. Loose or broken wire #02 from relay 24CR to base terminal block.
   - Check continuity. Replace if defective.
8. Loose or broken wire #24A from base terminal block to steer left valve coil 4H-24A.
   - Check continuity. Replace if defective.
9. Defective steer left valve coil 4H-24A.
   - Check coil. Replace if defective.
10. Loose or broken wire #02 from steer left valve coil 4H-24A to base terminal block.
    - Check continuity. Replace if defective.
11. Open diode D24A.
    - Check diode. Replace if defective.

4.1-21 Reverse Drive Inoperative

1. Defective drive reverse switch S7-4 in joystick S7.
   - Check switch. Replace if defective.
2. Defective joystick S7.
   - Check joystick. Replace if defective.
3. Loose or broken wire #15 from joystick S7 to platform terminal block.
   - Check continuity. Replace if defective.
4. Loose or broken wire #15 from platform terminal block to relay 15CR.
   - Check continuity. Replace if defective.
5. Defective relay 15CR.
   - Check relay. Replace if defective.
6. Loose or broken wire #02 from relay 15CR to base terminal block.
   - Check continuity. Replace if defective.
7. Loose or broken wire #04 from base terminal block to relay 15CR.
   - Check continuity. Replace if defective.
8. Loose or broken wire #15A from relay 15CR to time delay relay 1TD.
   - Check continuity. Replace if defective.
9. Defective time delay relay 1TD.
   - Check relay. Replace if defective.
10. Loose or broken wire #15B from time delay relay 1TD to reverse valve coil 4H-15B.
    - Check continuity. Replace if defective.
11. Defective reverse valve coil 4H-15B.
    - Check coil. Replace if defective.
12. Loose or broken wire #02 from reverse valve coil 4H-15B to base terminal block.
    - Check continuity. Replace if defective.
13. Open diode D15A-1 or D15A-2.
    - Check diodes. Replace if defective.

4.1-22 Forward Drive Inoperative

1. Defective drive forward switch S7-5 in joystick S7.
   - Check switch. Replace if defective.
2. Defective joystick S7.
   - Check joystick. Replace if defective.

Electrical System (Continued)

3. Loose or broken wire #16 from joystick S7 to platform terminal block.
   - Check continuity. Replace if defective.
4. Loose or broken wire #16 from platform terminal block to relay 16CR.
   - Check continuity. Replace if defective.
5. Defective relay 16CR.
   - Check relay. Replace if defective.
6. Loose or broken wire #02 from relay 16CR to base terminal block.
   - Check continuity. Replace if defective.
7. Loose or broken wire #04 from base terminal block to relay 16CR.
   - Check continuity. Replace if defective.
8. Loose or broken wire #16A from relay 16CR to time delay relay 1TD.
   - Check continuity. Replace if defective.
9. Defective time delay relay 1TD.
   - Check relay. Replace if defective.
10. Loose or broken wire #16B from time delay relay 1TD to forward valve coil 4H-16B.
    - Check continuity. Replace if defective.
11. Defective forward valve coil 4H-16B.
    - Check coil. Replace if defective.
12. Loose or broken wire #02 from forward valve coil 4H-16B to base terminal block.
    - Check continuity. Replace if defective.
13. Open diode D16A-1 or D16A-2.
    - Check diodes. Replace if defective.

4.1-23 First Drive Speed and Steering Inoperative

1. Loose or broken wire #21 from base terminal block to relay 17ACR. (ANSI/CSA only)
   - Check continuity. Replace if defective.
1. Loose or broken wire #21 from diode D24A to relay 17ACR. (CE only)
   - Check continuity. Replace if defective.
2. Defective relay 17ACR.
   - Check relay. Replace if defective.
3. Loose or broken wire #18A from relay 17ACR to small pump dump valve solenoid 2H-18A.
   - Check continuity. Replace if defective.
4. Defective small pump dump valve coil 2H-18A.
   - Check coil. Replace if defective.
5. Loose or broken wire #02 from small pump dump solenoid 2H-18A to base terminal block.
   - Check continuity. Replace if defective.

4.1-24 Second Drive Speed Inoperative

1. Defective second speed switch S7-1 in joystick S7.
   - Check switch. Replace if defective.
2. Defective joystick S7.
   - Check joystick. Replace if defective.
3. Loose or broken wire #19 from controller S7-1 to platform terminal block.
   - Check continuity. Replace if defective.
4. Loose or broken wire #19 from platform terminal block to diode D19 at relay 35CR.
   - Check continuity. Replace if defective.
5. Loose or Open diode D19.
   - Tighten diode. Check diode. Replace if defective.
6. Loose or broken wire #10A from base terminal block to high drive/tilt override limit switch LS5.
   - Check continuity. Replace if defective.

Electrical System (Continued)

7. Misadjusted or defective high drive/tilt override limit switch LS5.
   - Adjust switch. Replace if defective.
8. Loose or broken wire #35 from high drive/tilt override limit switch LS5 to base terminal block.
   - Check continuity. Replace if defective.
9. Loose or broken wire #35 from base terminal block to relay 35CR.
   - Check continuity. Replace if defective.
10. Loose or broken wire #02 from relay 35CR to base terminal block.
    - Check continuity. Replace if defective.
11. Defective relay 35CR.
    - Check relay. Replace if defective.
12. Loose or broken wire #17 from relay 35CR to relay 17CR.
    - Check continuity. Replace if defective.
13. Defective relay 17CR.
    - Check relay. Replace if defective.
14. Loose or broken wire #02 from relay 17CR to base terminal block.
    - Check continuity. Replace if defective.
15. Loose or broken wire #10A from base terminal block to relay 17CR.
    - Check continuity. Replace if defective.
16. Loose or broken wire #17A from relay 17CR to base terminal block.
    - Check continuity. Replace if defective.
17. Loose or broken wire #17A from relay 17CR to relay 17ACR.
    - Check continuity. Replace if defective.
18. Defective relay 17ACR.
    - Check relay. Replace if defective.
19. Loose or broken wire #02 from relay 17ACR to base terminal block.
    - Check continuity. Replace if defective.
20. Loose or broken wire #17A from base terminal block to large pump dump valve solenoid 2H-17A.
    - Check continuity. Replace if defective.
21. Loose or broken wire #02 from large pump dump valve solenoid 2H-17A to base terminal block.
    - Check continuity. Replace if defective.
22. Defective large pump dump valve solenoid 2H-17A.
    - Check solenoid. Replace if defective.

4.1-25 Third Drive Speed Inoperative

1. High/Low torque switch S41 in high torque position or defective.
   - Turn high/low torque switch to low torque position. Replace if defective.
2. Defective third speed switch S7-6 in joystick S7.
   - Check switch. Replace if defective.
3. Defective joystick S7.
   - Check joystick. Replace if defective.
4. Loose or broken wire #18B from controller S7-6 to low/high torque switch S41.
   - Check continuity. Replace if defective.
5. Loose or broken wire #18 from low/high torque switch S41 to platform terminal block.
   - Check continuity. Replace if defective.
6. Loose or broken wire #18 from platform terminal block to relay 18CR.
   - Check continuity. Replace if defective.
7. Defective relay 18CR.
   - Check relay. Replace if defective.
8. Loose or broken wire #02 from relay 18CR to base terminal block.
   - Check continuity. Replace if defective.

Electrical System (Continued)

9. Loose or broken wire #10A from base terminal block to relay 18CR.
   - Check continuity. Replace if defective.
10. Loose or broken wire #18A from relay 18CR to small pump dump valve 2H-18A.
   - Check continuity. Replace if defective.
11. Loose or broken wire #02 from small pump dump valve 2H-18A to base terminal block.
   - Check continuity. Replace if defective.
12. Defective small pump dump valve solenoid 2H-18A.
   - Check solenoid. Replace if defective.

4.1-26 High/Low Range Speed Inoperative

1. Loose or broken wire #12 from joystick enable switch S7-7 to high/low range switch S29.
   - Check continuity. Replace if defective.
2. Defective high/low range switch S29.
   - Check switch. Replace if defective.
3. Loose or broken wire #20B from high/low range switch S29 to high/low torque switch S41.
   - Check continuity. Replace if defective.
4. Defective high/low torque switch S41.
   - Check switch. Replace if defective.
5. Loose or broken wire #20 from high/low torque switch S41 to relay 20CR.
   - Check continuity. Replace if defective.
6. Defective relay 20CR.
   - Check relay. Replace if defective.
7. Loose or broken wire #02 from relay 20CR to base terminal block.
   - Check continuity. Replace if defective.
8. Loose or broken wire #10A (ANSI/CSA) or wire #10C (CE) from base terminal block to relay 35CR.
   - Check continuity. Replace if defective.
9. Defective relay 35CR.
   - Check relay. Replace if defective.
10. Loose or broken wire #44 from relay 35CR to relay 20CR.
   - Check continuity. Replace if defective.
11. Loose or broken wire #20A from relay 20CR to base terminal block TB-1.
   - Check continuity. Replace if defective.
12. Loose or broken wire #20A from base terminal block to series parallel valve coil 3H-20A.
   - Check continuity. Replace if defective.
13. Defective series/parallel valve coil 3H-20A.
   - Check coil. Replace if defective.
14. Loose or broken wire #02 from series/parallel valve coil 3H-20A to base terminal block.
   - Check continuity. Replace if defective.

4.1-27 Up Circuit Inoperative from Platform or Base

1. Lift/Off/Drive switch S3 in drive position or defective.
   - Select lift position. Check switch. Replace if defective.
2. Loose or broken wire #09 from lift/off/drive switch S3 to lift enable switch S9.
   - Check continuity. Replace if defective.
3. Defective lift enable switch S9.
   - Check switch. Replace if defective.
4. Loose or broken wire #9A from enable switch S9 to up/down switch S5.
   - Check continuity. Replace if defective.
5. Defective up/down switch S5.
   - Check switch. Replace if defective.

Electrical System (Continued)

6. Loose or broken wire #14 from up/down switch S5 to relay 14CR. (ANSI/CSA)
   - Check continuity. Replace if defective.
7. Loose or broken wire #14 from up/down switch S5 to diode D14 at base terminal block TB-1. (CE)
   - Check continuity. Replace if defective.
8. Loose or Open diode D14. (CE)
   - Tighten diode. Check diode. Replace if defective.
9. Loose or broken wire #14D from base terminal block to relay 14DCR (CE).
   - Check continuity. Replace if defective.
10. Loose or broken wire #02 from relay 14CR (ANSI/CSA) or 14DCR (CE) to base terminal block.
    - Check continuity. Replace if defective.
11. Defective relay 14CR (ANSI/CSA) or 14DCR (CE).
    - Check relay. Replace if defective.
12. Loose or broken wire #36A from pin #10 on connector CN14 at the outrigger board to terminal block TB-1.
    - Check continuity. Replace if defective.
13. Loose or broken wire #36A from terminal block TB-1 to end of stroke limit switch LS4.
    - Check continuity. Replace if defective.
14. Defective end of stroke limit switch LS4.
    - Check switch. Replace if defective.
15. Loose or broken wire #36B from end of stroke limit switch LS4 to relay 14CR.
    - Check continuity. Replace if defective.
16. Defective relay 14CR.
    - Check relay. Replace if defective.
17. Loose or broken wire #14A from relay 14CR to relay 28CR.
    - Check continuity. Replace if defective.
18. Loose or broken wire #14B from relay 28CR to base terminal block.
    - Check continuity. Replace if defective.
19. Loose or broken wire #14B from base terminal block to lift valve solenoid 2H-14B.
    - Check continuity. Replace if defective.
20. Loose or broken wire #02 from lift valve solenoid 2H-14B to base terminal block.
    - Check continuity. Replace if defective.
21. Defective lift valve solenoid 2H-14B.
    - Check solenoid. Replace if defective.

13. Open diode D14B-1.
    - Check diode. Replace if defective.

4.1-28 Platform will Not Lift from Platform or Base Controls with Outriggers Extended

1. Outriggers not extended enough.
   - Extend outriggers to take weight off tires (refer to operator section).
2. Loose or broken wire #10A from terminal block TB-1 to pin #4 on connector CN14 at the outrigger board.
   - Check continuity. Replace if defective.
3. Loose or broken wire #10A from outrigger board to outrigger limit switch LS68.
   - Check continuity. Replace if defective.
4. Defective outrigger limit switch LS68.
   - Check switch. Replace if defective.
5. Loose or broken wire #68A from outrigger limit switch LS68 to outrigger control module at pin P2-1.
   - Check continuity. Replace if defective.
6. Loose or broken wire #10A from outrigger board to outrigger limit switch LS67.
   - Check continuity. Replace if defective.

Electrical System (Continued)

7. Defective outrigger limit switch LS67.
   - Check switch. Replace if defective.
8. Loose or broken wire #67A from outrigger limit switch LS67 to outrigger control module at pin P2-2.
   - Check continuity. Replace if defective.
9. Loose or broken wire #10A from outrigger board to outrigger limit switch LS66.
   - Check continuity. Replace if defective.
10. Defective outrigger limit switch LS66.
    - Check switch. Replace if defective.
11. Loose or broken wire #66A from outrigger limit switch LS66 to outrigger control module at pin P2-3.
    - Check continuity. Replace if defective.
12. Loose or broken wire #10A from outrigger board to outrigger limit switch LS65.
    - Check continuity. Replace if defective.
13. Defective outrigger limit switch LS65.
    - Check switch. Replace if defective.
14. Loose or broken wire #65A from outrigger limit switch LS65 to outrigger control module at pin P2-4.
    - Check continuity. Replace if defective.
15. Check for power on wire #65 at outrigger control module at pin P2-8.
    - If no voltage present, proceed to outrigger control module troubleshooting.
16. Loose or broken wire #65 from outrigger control module at pin P2-8 to outrigger board CN22 pin #16.
    - Check continuity. Replace if defective.
17. Defective lift enable relay 65CR.
    - Check relay. Replace if defective.
18. Defective lift disable relay 17DCR.
    - Check relay. Replace if defective.
19. Loose or broken wire #36A from pin #10 on connector CN14 at the outrigger board to terminal block TB-1.
    - Check continuity. Replace if defective.
20. Loose or broken wire #36A from terminal block TB-1 to end of stroke limit switch LS4.
    - Check continuity. Replace if defective.
21. Defective end of stroke limit switch LS4.
    - Check switch. Replace if defective.
22. Loose or broken wire #36B from end of stroke limit switch LS4 to relay 14CR.
    - Check continuity. Replace if defective.
23. Defective relay 14CR.
    - Check relay. Replace if defective.
24. Loose or broken wire #14A from relay 14CR to relay 28CR.
    - Check continuity. Replace if defective.
25. Loose or broken wire #14B from relay 28CR to base terminal block.
    - Check continuity. Replace if defective.
26. Loose or broken wire #14B from base terminal block to lift valve solenoid 2H-14B.
    - Check continuity. Replace if defective.
27. Loose or broken wire #02 from lift valve solenoid 2H-14B to base terminal block.
    - Check continuity. Replace if defective.
28. Defective lift valve solenoid 2H-14B.
    - Check solenoid. Replace if defective.

Electrical System (Continued)

4.1-29 Platform will Not Lift from Platform or Base Controls with Outriggers Retracted (lift operates correctly with outriggers extended)

1. Outriggers not fully retracted.
   - Fully retract outrigger cylinders.
2. Loose or broken wire #1 from relay 28CR (ANSI/CSA) or 28CR1 (CE) to pin #7 on connector CN14 at the outrigger board.
   - Check continuity. Replace if defective.
3. Loose or broken wire #1 from outrigger board to outrigger limit switch LS64.
   - Check continuity. Replace if defective.
4. Defective outrigger limit switch LS64.
   - Check switch. Replace if defective.
5. Loose or broken wire #64 from outrigger limit switch LS64 to outrigger board.
   - Check continuity. Replace if defective.
6. Loose or broken wire #64 from outrigger board to outrigger limit switch LS63.
   - Check continuity. Replace if defective.
7. Defective outrigger limit switch LS63.
   - Check continuity. Replace if defective.
8. Loose or broken wire #63 from outrigger limit switch LS63 to outrigger board.
   - Check continuity. Replace if defective.
9. Loose or broken wire #63 from outrigger board to outrigger limit switch LS62.
   - Check continuity. Replace if defective.
10. Defective Limit Switch LS62.
    - Check switch. Replace if defective.
11. Loose or broken wire #62 from outrigger limit switch LS62 to outrigger board.
    - Check continuity. Replace if defective.
12. Loose or broken wire #62 from outrigger board to outrigger limit switch LS61.
    - Check continuity. Replace if defective.
13. Defective outrigger limit switch LS61.
    - Check switch. Replace if defective.
14. Loose or broken wire #61 from outrigger limit switch LS61 to outrigger board .
    - Check continuity. Replace if defective.
15. Open diode D36 on outrigger board.
    - Check diode. Replace if defective.

4.1-30 Up Circuit Inoperative from Base (ANSI/CSA)

1. Loose or broken wire #10A from base terminal block to base enable switch S10.
   - Check continuity. Replace if defective.
2. Defective base enable switch S10.
   - Check switch. Replace if defective.
3. Loose or broken wire #10E from base enable switch S10 to base up/down switch S2.
   - Check continuity. Replace if defective.
4. Defective base up/down switch S2.
   - Check switch. Replace if defective.
5. Loose or broken wire #14 from base up/down switch S2 to base terminal block TB-1.
   - Check continuity. Replace if defective.

4.1-31 Up Circuit Inoperative from Base (CE)

1. Loose or broken wire #7C from base emergency stop switch S6 to platform emergency stop switch S4.
   - Check continuity. Replace if defective.

Electrical System (Continued)

2. Defective platform emergency stop switch S4.
   - Check switch. Replace if defective.
3. Loose or broken wire #10D from platform emergency stop switch S4 to idle/platform/base key switch S10.
   - Check continuity. Replace if defective.
4. Defective idle/platform/base key switch S10.
   - Check switch. Replace if defective.
5. Loose or broken wire #10E from idle/platform/base key switch S10 to up/down switch S2.
   - Check continuity. Replace if defective.
6. Loose or broken wire #14E from up/down switch S2 to base terminal block.
   - Check continuity. Replace if defective.
7. Defective up/down switch S2.
   - Check switch. Replace if defective.
8. Loose or Open diode D14E-1 or D10E.
   - Tighten diode. Check diode. Replace if defective.
9. Loose or broken wire #10E from base terminal block to control module CM1 at pin #P2-2.
   - Check continuity. Replace if defective.

4.1-32 Down Circuit Inoperative from Platform or Base

1. Lift/Off/Drive switch S3 in drive position or defective.
   - Select lift position. Check switch. Replace if defective.
2. Loose or broken wire #09 from lift/off/drive switch S3 to lift enable switch S9.
   - Check continuity. Replace if defective.
3. Defective lift enable switch S9.
   - Check switch. Replace if defective.
4. Loose or broken wire #9A from enable switch S9 to up/down switch S5.
   - Check continuity. Replace if defective.
5. Defective up/down switch S5.
   - Check switch. Replace if defective.
6. Loose or broken wire #13 from up/down switch S5 to relay 13CR. (ANSI/CSA)
   - Check continuity. Replace if defective.
7. Loose or broken wire #13 from up/down switch S5 to diode D13 at base terminal block TB-1. (CE)
   - Check continuity. Replace if defective.
8. Loose or Open diode D13. (CE)
   - Tighten diode. Check diode. Replace if defective.
9. Loose or broken wire #13D to relay 13DCR (CE).
   - Check continuity. Replace if defective.
10. Loose or broken wire #02 from relay 13CR (ANSI/CSA) or 13DCR (CE) to base terminal block TB-1.
    - Check continuity. Replace if defective.
11. Defective relay 13CR (ANSI/CSA) or 13DCR (CE).
    - Check relay. Replace if defective.
12. Loose or broken wire #10A from base terminal block to relay 13CR. (ANSI/CSA only)
    - Check continuity. Replace if defective.
13. Loose or broken wire #13A from relay 13CR (ANSI/CSA) or 13DCR (CE) to base terminal block.
    - Check continuity. Replace if defective.
14. Loose or broken wire #13A from base terminal block to holding valve solenoid 2H-13A-1 or 2H-13A-2 or 2H-13A-3 or 2H-13A-4.
    - Check continuity. Replace if defective.

Electrical System (Continued)

15. Loose or broken wire #02 from holding valve solenoid 2H-13A-1 or 2H-13A-2 or 2H-13A-3 or 2H-13A-4 to base terminal block TB-1.
    - Check continuity. Replace if defective.
16. Defective holding valve solenoid 2H-13A-1 or 2H-13A-2 or 2H-13A-3 or 2H-13A-4.
    - Check solenoid. Replace if defective.
17. Loose or broken wire #13A from base terminal block to lowering valve solenoid 2H-13A.
    - Check continuity. Replace if defective.
18. Loose or broken wire #02 from lowering valve solenoid 2H-13A to base terminal block.
    - Check continuity. Replace if defective.
19. Defective lowering valve solenoid 2H-13A.
    - Check solenoid. Replace if defective.

No Down Function (Additional for machines with Load Sensing System) (CE)

1. Loose or broken wire #02 from base terminal strip TB-1 to down enable relay 28CR2 or auxiliary down enable relay 28ECR2.
    - Check continuity. Replace if defective.
2. Defective down enable relay 28CR2 or auxiliary down enable relay 28ECR2.
    - Check relay. Replace if defective.
3. Loose or broken wire #28 from control module CM1 at pin #P3-4 to down enable relay 28CR2.
    - Check continuity. Replace if defective.
4. Loose or broken wire #28E from control module CM1 at pin #P3-6 to auxiliary down enable relay 28ECR2.
    - Check continuity. Replace if defective.
5. Loose or broken wire #10A from base terminal block to auxiliary down enable relay 28ECR2.
    - Check continuity. Replace if defective.
6. Loose or broken wire #13C from auxiliary down enable relay 28ECR2 to down enable relay 28CR2.
    - Check continuity. Replace if defective.
7. Loose or broken wire #13B from down enable relay 28CR2 to down relay 28DCR.
    - Check continuity. Replace if defective.

4.1-33 Down Circuit Inoperative from Base (ANSI/CSA)

1. Loose or broken wire #10A from base terminal block to base enable switch S10.
    - Check continuity. Replace if defective.
2. Defective base enable switch S10.
    - Check switch. Replace if defective.
3. Loose or broken wire #10E from base enable switch S10 to base up/down switch S2.
    - Check continuity. Replace if defective.
4. Defective base up/down switch S2.
    - Check switch. Replace if defective.
5. Loose or broken wire #13 from base up/down switch S2 to base terminal block TB-1.
    - Check continuity. Replace if defective.

4.1-34 Down Circuit Inoperative from Base (CE)

1. Loose or broken wire #7C from base emergency stop switch S6 to platform emergency stop switch S4.
    - Check continuity. Replace if defective.
2. Defective platform emergency stop switch S4.
    - Check switch. Replace if defective.

Electrical System (Continued)

3. Loose or broken wire #10D from platform emergency stop switch S4 to idle/platform/base key switch S10.
   - Check continuity. Replace if defective.
4. Defective idle/platform/base key switch S10.
   - Check switch. Replace if defective.
5. Loose or broken wire #10E from idle/platform/base key switch S10 to up/down switch S2.
   - Check continuity. Replace if defective.
6. Loose or broken wire #13D from up/down switch S2 to base terminal block TB-1.
   - Check continuity. Replace if defective.
7. Defective up/down switch S2.
   - Check switch. Replace if defective.

4.1-35 Powered Extension Platform Inoperative

1. Loose or broken battery cable from main power disconnect switch S1 to fuse F2 (100 Amp).
   - Check continuity. Replace if defective.
2. Open fuse F2.
   - Check fuse. Replace if open.
3. Loose or broken battery cable #103A from fuse F2 to contactor 9CR1.
   - Check continuity. Replace if defective.
4. Defective contactor 9CR1.
   - Check contactor. Replace if defective.
5. Loose or broken battery cable #103B from contactor 9CR1 to motor contactor 99CR.
   - Check continuity. Replace if defective.
6. Defective motor contactor 99CR.
   - Check contactor. Replace if defective.
7. Loose or broken wire #103B from battery cable #103B to fuse F5.
   - Check continuity. Replace if defective.
8. Defective fuse F5.
   - Check fuse. Replace if defective.
9. Loose or broken wire #103C from fuse F5 to powered platform enable switch S34 or S34A.
   - Check continuity. Replace if defective.
10. Loose or broken wire #103D from enable switch S34or S34A to platform extend retract switch S11 or S11A.
    - Check continuity. Replace if defective.
11. Defective platform extend/retract switch S11 or S11A.
    - Check switch. Replace if defective.
12. Defective platform enable switch S34 or S34A.
    - Check switch. Replace if defective.
13. Loose or broken battery cable #00 from platform power unit DCM1 to battery B1.
    - Check continuity. Replace if defective.
14. Defective platform power unit DCM1.
    - Check power unit. Repair or replace if defective.

4.1-36 Powered Extension Platform will Not Extend

1. Defective platform extend/retract switch S11 or S11A.
   - Check switch. Replace if defective.
2. Loose or broken wire #26 or #26A from platform extend/retract switch S11 or S11Ato platform extend valve coil 4H-26 or 4H-26A.
   - Check continuity. Replace if defective.

Electrical System (Continued)

3. Open diode D26 or D26A.
   - Check diode. Replace if defective.
4. Defective platform extend valve coil 4H-26 or 4H-26A.
   - Check coil. Replace if defective.
5. Loose or broken wire #00 from platform extend valve coil 4H-26 or 4H-26A to battery cable #00.
   - Check continuity. Replace if defective.

4.1-37 Powered Extension Platform will Not Retract

1. Defective platform extend/retract switch S11 or S11A.
   - Check switch. Replace if defective.
2. Loose or broken wire #27 or #27A from platform extend/retract switch S11 or S11A to platform retract valve coil 4H-27 or 4H-27A.
   - Check continuity. Replace if defective.
3. Open diode D27 or D27A.
   - Check diode. Replace if defective.
4. Defective platform retract valve coil 4H-27 or 4H-27A.
   - Check coil. Replace if defective.
5. Loose or broken wire #00 from platform retract valve coil 4H-27 or 4H-27A to battery cable #00.
   - Check continuity. Replace if defective.

4.1-38 Hydraulic Generator Inoperative

1. Key switch S3 in drive position.
   - Turn switch to lift position.
2. Loose or broken wire #9 from base terminal block TB-1 to generator relay 86BCR.
   - Check continuity. Replace if defective.
3. Loose or broken wire #9 from generator relay 86BCR to generator switch S12.
   - Check continuity. Replace if defective.
4. Defective generator switch S12.
   - Check switch. Replace if defective.
5. Loose or broken wire #85 from generator switch S12 to generator relay 86ACR.
   - Check continuity. Replace if defective.
6. Loose or broken wire #85 from generator relay 86ACR to generator relay 86BCR.
   - Check continuity. Replace if defective.
7. Loose or broken wire #86B from generator relay 86ACR to generator relay 86BCR.
   - Check continuity. Replace if defective.
8. Defective relay 86ACR.
   - Check relay. Replace if defective.
9. Defective relay 86BCR.
   - Check relay. Replace if defective.
10. Open diode D86C-1.
    - Check diode. Replace if defective.
11. Loose or broken wire #17 from diodes D86B-1 to relay 17CR.
    - Check continuity. Replace if defective.
12. Loose or broken wire #2A from relays 10ACR2 and 86BCR to relay 10ACR1.
    - Check continuity. Replace if defective.
13. Loose or broken wire #85A from circuit breaker CB4 to relay 86BCR.
    - Check continuity. Replace if defective.
14. Tripped or defective circuit breaker CB4.
    - Reset circuit breaker. Replace if defective.

Electrical System (Continued)

15. Loose or broken wire #3 from circuit breaker CB4 to circuit breaker CB1.
    - Check continuity. Replace if defective.
16. Loose or broken wire #86C from relay 86BCR to generator valve coil 2H-86C.
    - Check continuity. Replace if defective.
17. Loose or broken wire #02 from base terminal block to generator valve coil 2H-86C.
    - Check continuity. Replace if defective.
18. Defective generator valve coil 2H-86C.
    - Check coil. Replace if defective.

4.1-39 Hydraulic Generator will Not Shut Off from Generator Switch

1. Defective generator switch S12.
    - Check switch. Replace if defective.
2. Loose or broken wire #86 from generator switch S12 to diode D86.
    - Check continuity. Replace if defective.
3. Open diode D86.
    - Check diode. Replace if defective.
4. Defective relay 86ACR.
    - Check relay. Replace if defective.
5. Loose or broken wire #02 from base terminal block to relay 86ACR.
    - Check continuity. Replace if defective.

4.1-40 All Outriggers Inoperative (Auto-level and manual)

WARNING

Scissors lift must be below high speed limit switch for outriggers to function.

NOTE

For the outriggers to function the upper control console must be in the lift position.

1. No power on wire #44 at relay 35CR.
    - If no power is present ensure there is power on wire #35 and relay 35CR operates correctly.
2. Loose or broken wire #44 from relay 35CR to pin #6 on connector CN14 on outrigger board.
    - Check for continuity. Replace if defective.
3. No power at wire #9 at pin #5 on connector CN14 on outrigger board.
    - If no power is present check for continuity on wire #9 back to base terminal block TB-1. Replace if defective.
4. Defective relay 9CR2 or 9CR3 on outrigger board.
    - Check relays. Replace if defective.
5. Defective relay 17DCR on outrigger board.
    - Check relay. Replace if defective.
6. Open or broken jumper J17E on outrigger board.
    - Check jumper. Replace if defective.
7. Open diode D17B-1 on outrigger board.
    - Check diode. Replace if defective.
8. Loose or broken wire #17 from pin #2 on connector CN14 on outrigger board to relay 35CR or relay 17CR.
    - Check for continuity. Replace if defective.

Electrical System (Continued)

9. Loose or broken wire #17B from pin #1 or wire #02 from pin #2 on connector CN21 on outrigger board to outrigger holding valve coil 2H-17B.
   - Check for continuity. Replace if defective.
10. Defective outrigger holding valve coil 2H-17B.
   - Check coil. Replace if defective.

4.1-41 All Outriggers Inoperative (Auto-level and manual from platform controls)

1. Loose or broken wire #35C from pin #1 on connector CN20 on outrigger board through outrigger cables and plugs to the outrigger enable switch S9A in the control console.
   - Check for continuity. Replace if defective.
2. Loose or broken wire #35D from outrigger enable switch S9A to pin #5 on the outrigger control console plug.
   - Check for continuity. Replace if defective.
3. Defective outrigger enable switch S9A.
   - Check switch. Replace if defective.

4.1-42 All Outriggers Inoperative (base controls)

1. Defective outrigger enable switch S9B.
   - Check switch. Replace if defective.

4.1-43 All Outriggers Inoperative (Auto-level)

A: Led Power Indicator Light at Outrigger Control Module (OCM1) Not on Constant

1. Loose or broken wire #10A from pin #1 of the tilt switch connector to pin P2-12 on the outrigger control module OCM1.
   - Check for continuity. Replace if defective.
2. Loose or broken wire #10A from pin #1 of the tilt switch connector to main terminal block TB-1.
   - Check for continuity. Replace if defective.
3. Loose or broken wire #02 from pin #3 of the tilt switch connector to pin P2-11 on the outrigger control module OCM1.
   - Check for continuity. Replace if defective.
4. Loose or broken wire #02 from pin #3 of the tilt switch connector to main terminal block TB-1.
   - Check for continuity. Replace if defective.
5. Defective outrigger control module OCM1.
   - Replace.
   -

Electrical System (Continued)

4.1-44 All Outriggers Inoperative (Auto Level)
B: Led Power Indicator Light at Outrigger Control Module (OCM1) Flashing

Flash Code	Probable Cause	Remedy
1/1	1. Outriggers are all up and machine is tilted.	1. Level the machine.
1/2	1. Machine is elevated. 2. Loose or broken wire # 35.	1. Lower the scissor stack below high speed limit switch. 2. Check for input voltage on wire #35 at pin P2-10 of the outrigger control module (OMC1). Replace if defective.
2/2	1. At least one outrigger is not fully retracted. 2. Defective outrigger rod limit switch (LS61, LS62, LS63, LS64) or wiring. 3. Defective diode (D36) on outrigger board.	1. Fully retract all outriggers. 2. Replace defective or damaged switch(es) or wiring. 3. Check for continuity. Replace if defective.
2/1	1. Outriggers are all down and the machine is not fully level.	1. Move machine to less sloped terrain if it will not lift.
5/5	1. Power on wire #70 or #79 at power on. 2. Power on wire #70 or #79 when manually operating outriggers.	1. Check for power on wire #70 or #79 at pin P2-5 or P2-6 of the outrigger control module. Replace defective component. 2. Check for power on wire #70 or #79 while manually operating an outrigger.
5/2	1. Low or no voltage on wire #35c. 2. Loose or broken wire on #35c.	1. Check battery and charging system to ensure minimum 9 volts. 2. Check for input voltage on wire #35c at pin P4-9 of outrigger control module (OCM1).
7/1	1. Excessive vibration. 2. Defective outrigger control module.	1. Outrigger control module cannot read tilt sensor. 2. Replace.
6/6	1. Outriggers are being manually controlled.	1. Indicates function activated. No repair necessary.
7/8	1. Error occured while self diagnosing the hardware fail safe.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
5/1	1. Low input voltage to outrigger control module.	1. Check for minimum 9 volts between wire #02 at pin P2-11 and wire #10A at pin P2-12 at outrigger control module.
7/7	1. Startup error occurred while self diagnosing.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
7/5	1. Internal failure of OCM1.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
7/2	1. Internal failure of OCM1.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
8/1	1. Internal failure of OCM1.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
8/2	1. Internal failure of OCM1.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
8/3	1. Internal failure of OCM1.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
8/4	1. Internal failure of OCM1.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
8/5	1. Internal failure of OCM1.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.
7/6	1. Internal failure of OCM1.	1. Turn off power to reset the outrigger control module. Turn power back on and see if the code has cleared. If problem persists, replace outrigger control module.

60416AA

Electrical System (Continued)

4.1-45 Left Front Outrigger Inoperative Manually

1. Defective left front outrigger switch S20 at platform, or S20A at base.
   - Check switch. Replace if defective.
2. Loose or broken wire #71 from outrigger control console to pin #6 on connector CN20 at outrigger board (retract), or from wire #75 to pin #7 (extend).
   - Check continuity. Replace if defective.
3. Open diode D71 (retract) or D75 (extend) on outrigger board.
   - Check diode. Replace if defective.
4. Loose or broken wire #71 from pin #7 on connector CN21 at outrigger board to valve coil 4H-71 (retract) , or wire #75 from pin #8 to 4H-75 (extend).
   - Check continuity. Replace if defective.
5. Loose or broken wire #02 from valve coil 4H-71 (retract) or 4H-75 (extend) to pin #2 on connector CN21 at the outrigger board.
   - Check continuity. Replace if defective.

4.1-46 Right Front Outrigger Inoperative Manually

1. Defective right front outrigger switch S21 at platform, or S21A at base.
   - Check switch. Replace if defective.
2. Loose or broken wire #72 from outrigger control console to pin #8 on connector CN20 at outrigger board (retract), or from wire #76 to pin #9 (extend).
   - Check continuity. Replace if defective.
3. Open diode D72 (retract) or D76 (extend) on outrigger board.
   - Check diode. Replace if defective.
4. Loose or broken wire #72 from pin #9 on connector CN21 at outrigger board to valve coil 4H-72 (retract), or wire #76 from pin #10 to 4H-76 (extend).
   - Check continuity. Replace if defective.
5. Loose or broken wire #02 from valve coil 4H-72 (retract) or 4H-76 (extend) to pin #2 on connector CN21 at the outrigger board.
   - Check continuity. Replace if defective.

4.1-47 Right Rear Outriggers Inoperative Manually

1. Defective right rear outrigger switch S22 at platform, or S22A at base.
   - Check switch. Replace if defective.
2. Loose or broken wire #73 from outrigger control console to pin #3 on connector CN20 at outrigger board (retract), or from wire #77 to pin #4 (extend).
   - Check continuity. Replace if defective.
3. Open diode D73 (retract) or D77 (extend) on outrigger board.
   - Check diode. Replace if defective.
4. Loose or broken wire #73 from pin #4 on connector CN21 at outrigger board to valve coil 4H-73 (retract), or wire #77 from pin #4 to 4H-77 (extend).
   - Check continuity. Replace if defective.
5. Loose or broken wire #02 from valve coil 4H-73 (retract) or 4H-77 (extend) to pin #2 on connector CN21 at the outrigger board.
   - Check continuity. Replace if defective.

Electrical System (Continued)

4.1-48 Left Rear Outriggers Inoperative Manually

1. Defective left rear outrigger switch S23 at platform, or S23A at base.
   - Check switch. Replace if defective.
2. Loose or broken wire #74 from outrigger control console to pin #5 on connector CN20 at outrigger board (retract), or from wire #78 to pin #2 (extend).
   - Check continuity. Replace if defective.
3. Open diode D74 (retract) or D78 (extend) on outrigger board.
   - Check diode. Replace if defective.
4. Loose or broken wire #74 from pin #6 on connector CN21 at outrigger board to valve coil 4H-74 (retract), or wire #78 from pin #3 to 4H-78 (extend).
   - Check continuity. Replace if defective.
5. Loose or broken wire #02 from valve coil 4H-74 (retract) or 4H-78 (extend) to pin #2 on connector CN21 at the outrigger board.
   - Check continuity. Replace if defective.

4.1-49 Individual Outrigger Functions Inoperative (Auto-level)

1. Loose or broken wire #71- #75 (depending on function not working) at pins 1-8 of outrigger control module plug P4.
   - Check connections of outrigger functions not working (refer to Section 5 for pin reference chart). Replace if defective.
2. No output from outrigger control module OCM1 at pins 1-8 of outrigger control module plug P4.
   - Turn off power to reset the outrigger control module. Turn power back on and retest. If problem persists, replace outrigger control module.

4.1-50 Auto-level Inoperative

1. Loose or broken wire #35D from outrigger enable switch S9A to auto mode outrigger switch S24.
   - Check continuity. Replace if defective.
2. Defective auto mode outrigger switch S24.
   - Check switch. Replace if defective.
3. Loose or broken wire #10A at pin #P2-12 on outrigger control module OCM1.
   - Check for power at P2-12. If no voltage present, check continuity of wire. Replace if defective.
4. Loose or broken wire #35 at pin #P2-10 on outrigger control module OCM1.
   - Check for power at P2-10. If no voltage present, check continuity of wire. Replace if defective.
5. Loose or broken wire #02 at pin #P2-11 on outrigger control module OCM1.
   - Check for ground at P2-11. If no ground present, check continuity of wire. Replace if defective.
6. Loose or broken wire #70 from auto mode outrigger switch S24 to pin #P2-5 on outrigger control module OCM1.
   - Check continuity. Replace if defective.

Electrical System (Continued)

4.1-51 Auto All Up Inoperative (Retract)

1. Loose or broken wire #35D from outrigger enable switch S9A to auto mode outrigger switch S24.
   - Check continuity. Replace if defective.
2. Defective auto mode outrigger switch S24.
   - Check switch. Replace if defective.
3. Loose or broken wire #10A at pin #P2-12 on outrigger control module OCM1.
   - Check for power at P2-12. If no voltage present, check continuity of wire. Replace if defective.
4. Loose or broken wire #35 at pin #P2-12 on outrigger control module OCM1.
   - Check for power at P2-10. If no voltage present, check continuity of wire. Replace if defective.
5. Loose or broken wire #02 at pin #P2-11 on outrigger control module OCM1.
   - Check for ground at P2-11. If no ground present, check continuity of wire. Replace if defective.
6. Loose or broken wire #70 from auto mode outrigger switch S24 to pin #P2-5 on outrigger control module OCM1.
   - Check continuity. Replace if defective.

Hydraulic System

4.2-1 All Functions Inoperative

1. Hydraulic oil level low.
   - Refill tank to proper level.
2. Defective pump P1.
   - Check pump. Repair or replace if defective.
3. Broken engine to pump coupler.
   - Check coupler. Replace if defective.
4. Open relief valve R1.
   - Check valve. Replace if defective.

4.2-2 Steering Inoperative

1. Stuck or defective brake feed valve 2H-30A-2.
   - Check valve. Repair or replace if defective.
2. Stuck or defective steer right valve 4H-23A or steer left valve 4H-24A.
   - Check valves. Replace if defective.
3. Steer cylinder C7 damaged or bypassing internally.
   - Check cylinder. Repair or replace if defective.

4.2-3 Steer and First Drive Speed Inoperative

1. Small pump dump valve 2H-18A stuck open.
   - Check valve. Repair or replace if defective.
2. Worn or defective small pump section of pump P1.
   - Check pump. Repair or replace if defective.
3. Check valve CV1 or CV2 stuck.
   - Check valves. Clean or replace if defective.

4.2-4 Lift and Second Drive Speed Inoperative

1. Large pump dump valve 2H-17A stuck open.
   - Check valve. Repair or replace if defective.
2. Worn or defective large pump section of pump P1.
   - Check pump. Repair or replace if defective.
3. Check valve CV1 or CV2 stuck.
   - Check valves. Clean or replace if defective.

4.2-5 Drive Inoperative

1. Stuck or defective drive reverse valve 4H-15B or drive forward valve 4H-16B.
   - Check valves. Repair or replace if defective.
2. Defective motion control valve MC1.
   - Check valve. Repair or replace if defective.
3. Missing or defective check balls in series/parallel valve manifold 3H-20A.
   - Repair or replace balls. Refer to Section 5 for proper location.
4. Stuck or defective main series/parallel valve spool V3 in drive motor.
   - Check valve. Repair or replace if defective.
5. Defective drive motor M1.
   - Check motor. Repair or replace if defective.
6. Free wheeling valve 2H-30A stuck.
   - Check valve. Repair or replace if defective.
7. Cushion cylinder C8 bypassing internally.
   - Check cylinder. Repair or replace if defective.

Hydraulic System (Continued)

4.2-6 Reverse Drive Inoperative

1. Stuck or defective drive valve 4H-15B.
   - Check valve. Repair or replace if defective.
2. Stuck or defective check valve in motion control assembly MC1.
   - Check valves. Clean or replace if defective.

4.2-7 Forward Drive Inoperative

1. Stuck or defective drive valve 4H-16B.
   - Check valve. Repair or replace if defective.
2. Stuck or defective check valve in motion control assembly MC1.
   - Check valves. Clean or replace if defective.

4.2-8 Brakes will Not Release

1. Stuck or defective brake feed valve 2H-30A-2.
   - Check valve. Repair or replace if defective.
2. Stuck or defective brake dump valve 2H-30A-1.
   - Check valve. Repair or replace if defective.
3. Stuck or defective brake valve 2H-25. (If equipped)
   - Check valve. Repair or replace if defective.
4. Stuck or defective auto reset valve V6. (If equipped)
   - Check valve. Repair or replace if defective.
5. Defective disc brake pack BP1. (Internal brake)
   - Check brake pack. Repair or replace if defective.
6. Defective brake cylinder C5 or C6. (External brake cylinders)
   - Check cylinder. Repair or replace if defective.

4.2-9 Brakes will Not Release (Internal Brake)

1. Bad o-rings internal to brake. (If release piston will not hold pressure, brake will not release.)
   - Check for hydraulic oil in axle. Replace o-rings if defective.
2. Discs frozen. (These brakes are designed for only limited dynamic braking. A severe emergency stop or prolonged reduced release pressure operation may result in this type of damage.)
   - Check for abnormal wear. Replace disc stack if defective.

4.2-10 Brake Slips (Internal Brake)

1. Excessive pressure in hydraulic system. (If there is back pressure in the actuation line of the brake, holding torque will be reduced)
   - Check filters, hose size, restrictions in other hydraulic components.
2. Oil in brake if designed for dry use. (Wet linings generate 67% of the dry torque rating. If the brake has oil in it, check the type of oil hydraulic or gearbox. i. Gearbox oil ii. Hydraulic oil)
   - Replace oil seal in brake. Check motor seal. Check piston seals.

NOTE

Internal components will need to be inspected, cleaned and replaced as required.

3. Disc plates worn. (The thickness of the disc stack sets the torque level. A thin stack reduces torque.)
   - Check brake's holding torque is sufficient.
   - i) Make sure the machine is parked on level ground.
   - ii) Locate the brake feed valve (2H30A-2) on the main manifold. Disconnect the electrical connectors from this valve. This will prevent the hydraulic system from releasing the brake.

Hydraulic System (Continued)

- iii) With the engine running, machine in drive mode, engine on high idle, high torque selected and low speed range selected, hold the enable switch on the joystick and push the joystick forward as if you were to drive forward. This provides torque from the drive motor to the unreleased brake.
- v) If the brake slips and the machine starts to move in this condition, either the brake plates are worn or the springs have broken. Both the springs and the brake plates must be replaced to return the brake to its original holding torque.

4.2-11 Brake Drags or Runs Hot (Internal Brake)

1. Low brake pressure.
   - Place pressure gauge in brake line. Brakes use system pressure. (Minimum 335 psi required)
2. Bearing failure (If the bearing should fail, a large amount of drag can be generated)
   - Replace bearing

4.2-12 Up Circuit Inoperative

1. Stuck or defective lift valve 2H-14B.
   - Check valve. Repair or replace if defective.
2. Stuck check valve CV3.
   - Check valve. Replace if defective.
3. Misadjusted or defective lift relief valve R2.
   - Adjust valve. Replace if defective.
4. Stuck or defective lowering valve 2H-13A.
   - Check valve. Repair or replace if defective.
5. Stuck or defective manual lowering valve V1.
   - Check valve. Repair or replace if defective.
6. Open or defective brake feed valve 2H-30A-2.
   - Check valve. Repair or replace if defective.
7. Open manual override on holding valve 2H-13A-1 or 2H-13A-2 or 2H-13A-3 or 2H-13A-4.
   - Depress and turn manual override clockwise to close. Replace if defective.
8. Stuck holding valve 2H13A-1 or 2H13A-2 or 2H-13A-3 or 2H-13A-4.
   - Check valves. Repair or replace if defective.

4.2-13 Down Circuit Inoperative

1. Stuck or defective lowering valve 2H-13A.
   - Check valve. Repair or replace if defective.
2. Stuck holding valve 2H13A-1 or 2H13A-2 or 2H-13A-3 or 2H-13A-4.
   - Check valves. Repair or replace if defective.
3. Plugged lowering orifice O1.
   - Clean or replace orifice.

4.2-14 Powered Extension Platform Inoperative

1. Defective powered extension pump P3.
   - Check pump. Repair or replace if defective.
2. Misadjusted or defective relief valve R5.
   - Adjust valve. Replace if defective.
3. Stuck or defective deck extend valve 4H-26 or 4H-26A or retract valve 4H-27 or 4H-27A.
   - Check valves. Repair or replace if defective.
4. Defective powered extension cylinder C13 front or C14 rear.
   - Check cylinder. Repair or replace if defective.

Hydraulic System (Continued)

4.2-15 Hydraulic Generator Inoperative

1. Stuck or defective hydraulic generator valve 2H-86C.
   - Check valve. Repair or replace if defective.
2. Misadjusted or defective flow control valve FC1.
   - Adjust valve. Replace if defective.
3. Stuck or defective large pump dump valve 2H-17A.
   - Check valve. Repair or replace if defective.
4. Defective hydraulic generator hydraulic motor GM1.
   - Check motor. Repair or replace if defective.

4.2-16 All Outriggers Inoperative

1. Stuck or defective outrigger holding valve 2H-17B.
   - Check valve. Repair or replace if defective.

4.2-17 Left Front Outrigger Inoperative

1. Stuck or defective retract valve 4H-71 or extend valve 4H-75.
   - Clean valve. Replace if defective.
2. Stuck or defective check valve CV5.
   - Check valve. Replace if defective.
3. Bypassing outrigger cylinder C9.
   - Repack cylinder. Replace if defective.

4.2-18 Right Front Outrigger Inoperative

1. Stuck or defective retract valve 4H-72 or extend valve 4H-76.
   - Clean valve. Replace if defective.
2. Stuck or defective Check valve CV6.
   - Check valve. Replace if defective.
3. Bypassing outrigger cylinder C10.
   - Repack cylinder. Replace if defective

4.2-19 Right Rear Outrigger Inoperative

1. Stuck or defective retract valve 4H-73 or extend valve 4H-77.
   - Clean valve. Replace if defective.
2. Stuck or defective check valve CV7.
   - Check valve. Replace if defective.
3. Bypassing outrigger cylinder C11.
   - Repack cylinder. Replace if defective

4.2-20 Left Rear Outrigger Inoperative

1. Stuck or defective retract valve 4H-74 or extend valve 4H-78.
   - Clean valve. Replace if defective.
2. Stuck or defective check valve CV4.
   - Check valve. Replace if defective.
3. Bypassing outrigger cylinder C12.
   - Repack cylinder. Replace if defective

4.2-21 Outriggers Drift In

1. Defective check valve left front (CV4), right front (CV5), right rear (CV6) or left rear (CV7)
   - Clean valve. Replace if defective.
2. Outriggers cylinder bypassing left front (C9), right front (C10), right rear (C11) or left rear (C12).
   - Repack cylinder. Replace if defective

Load Sensing System - CE

4.3-1 Flash Code F01: Check HWFS

1. This message is given if the GP102 startup tests have not completed.
   - Check HELP message for more information.

4.3-2 Flash Code F02: Not Ground Mode

1. This message is given if the machine is not in ground mode, P2-2 must be high.
   - Calibration can only be carried out in ground mode.

4.3-3 Flash Code F03: Not Stopped

1. This message is given if the machine is not in ground mode, P2-2 must be high.
   - Check DIAGNOSTICS / SWITCHES to see which function switch is closed.

4.3-4 Flash Code F04: Tilted

1. This message is given if the machine is tilted.
   - Calibration must be carried out with the machine level. If the machine is level, use the SETUPS / TILT SETUPS to set the GP102 level.

4.3-5 Flash Code F05: Bad Height

1. This message is given if the height sensor output P4-3 is out of range at the start of calibration.
   - The height sensor output must be between 1.0V and 4.0V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

4.3-6 Flash Code F06: Check Elev

1. This message is given if the elevation switch P2-10 is open at the start of calibration, when the operator has confirmed the “PLATFORM DOWN?” question.
   - If the platform is down, check the elevation switch wiring.

4.3-7 Flash Code F08: Check Elev

1. This message is given if the elevation switch P2-10 is closed at the end of the DYNAMIC lift, when the platform should be fully raised.

   This message would occur if the UP switch was accidentally opened near the start of the DYNAMIC lift.
   - If the platform is fully raised, check the elevation switch wiring.

4.3-8 Flash Code F09: Bad Height

1. This message is given if the height sensor output P4-3 is out of range at the start of the DYNAMIC lift.
   - The height sensor output must be between 1.0V and 4.0V. Check DIAGNOSTICS / SENSORS to see the output.

4.3-9 Flash Code F10: Bad Height

1. This message is given if the height sensor output P4-3 is out of range at the end of the DYNAMIC lift.
   - The height sensor output must be between 1.0V and 4.0V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

4.3-10 Flash Code F11: Not Up

1. This message occurs at the start of the DYNAMIC lift if the operator selects a function other than UP.
   - Select the UP function.

Load Sensing System - CE (Continued)

4.3-11 Flash Code F12: Too Many

1. This message occurs if the DYNAMIC lift takes too long. This message could occur if the UP switch was not released at the end of the dynamic lift.
    - If the machine takes more than two minutes to lift, the GP102 may need modification to avoid this problem.

4.3-12 Flash Code F13: Low Height Range

1. This message occurs at the end of the DYNAMIC lift if the height sensor output did not change sufficiently to give a reasonably accurate platform height estimate.

   This message could occur if the UP switch was accidentally opened too early (when the platform is not fully raised).

   This message would occur if the UP switch was accidentally opened near the start of the DYNAMIC lift.
    - If the platform is fully raised, check the elevation switch wiring.

4.3-13 Flash Code F14: Bad Height

1. This message occurs if the height sensor output P4-3 is out of range during the DYNAMIC lift.
    - The height sensor output must be between 1.0V and 4.0V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

4.3-14 Flash Code F15: Check Elev

1. This message is given if the elevation switch P2-10 is open when the platform has been fully lowered after the DYNAMIC lift.

   This message would occur if the DOWN switch was accidentally opened before the platform was fully lowered.
    - If the platform is fully lowered, check the elevation switch.

4.3-15 Flash Code F16: Low Elev.open

1. This message is given if the elevation switch P2-10 opened during lift at a too low height (below 5%).
    - If it opens below 5%, the pressure is probably too unpredictable to allow reliable detection of an overloaded platform when initially raised. Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

4.3-16 Flash Code F17: High Elev.open

1. This message is given if the elevation switch P2-10 opened during lift at a too high height (above 25%).
    - If it opens above 25%, the platform is too high when the overloaded platform is detected! Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

4.3-17 Flash Code F18: Low Elev.close

1. This message is given if the elevation switch P2-10 closed during lower at a too low height (below 5%).
    - If it closes below 5%, height sensor fault detection is compromised. Check CALIBRATIONS / HEIGHT CALS; the “ElevDown” value shows the recorded height where the switch opened.

Load Sensing System - CE (Continued)

4.3-18 Flash Code F19: High Elev.close

1. This message is given if the elevation switch P2-10 closed during lower at a too high height (above 25%).
    - When the switch is closed, overload detection is normally disabled but if the switch closes above 25%, the platform is too high to allow disabled overload. Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

4.3-19 Flash Code F20: Height<>0%

1. This message occurs if the platform height is not 0% after the platform has been fully lowered during either STATIC lift
    - The platform must return to the same height each time it is fully lowered. Check DIAGNOSTICS / SYSTEM to check the height.

4.3-20 Flash Code F21: Height<>0%

1. This message occurs if the platform height is not 0% before the platform is raised during either STATIC lift.
    - The platform must be at 0% height when it is fully lowered. Check DIAGNOSTICS / SYSTEM to check the height.

4.3-21 Flash Code F22: Height<>100%

1. This message occurs if the platform height is not 100% after the platform has been fully raised during either STATIC lift.
    - The platform must return to the same height each time it is fully raised. Check DIAGNOSTICS / SYSTEM to check the height.

4.3-22 Flash Code F23: Height<>100%

1. This message occurs if the platform height is not 100% before the platform is lowered during either STATIC lift.
    - The platform must be at 100% height when it is fully raised. Check DIAGNOSTICS / SYSTEM to check the height.

4.3-23 Flash Code F24: Too Many

1. This message occurs if too many static measurements are taken during either STATIC lift or lower.
    - It is likely that there is a problem with the lift cylinder pressure; the GP102 should only need about 10 measurements for most vehicles. The SETUPS / HEIGHT SETUPS / MIN LIFT time could be increased to force a longer time between static measurements, but this should not be necessary.

4.3-24 Flash Code F25: Check Elev

1. This message indicates a problem with the elevation switch P2-10 during the STATIC phases.
    - The switch is either staying closed to a higher height, or staying open to a lower height, than that recorded during the DYNAMIC phase.

4.3-25 Flash Code F26: Check Elev

1. This message indicates a problem with the elevation switch P2-10 during the STATIC phases.
    - The switch is opening or closing at a different height than that recorded during the DYNAMIC phase.

Load Sensing System - CE (Continued)

4.3-26 Flash Code F27: Bad Height

1. This message indicates a problem with the height sensor output P4-3 during the STATIC phases.
    - The height sensor output must be between 1.0V and 4.0V at all times. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

4.3-27 Flash Code F30: Bad Heights

1. This message indicates that the recorded heights are not increasing during either STATIC lift, or are not decreasing during either STATIC lower.
    - It may be possible to cause this problem by repeatedly opening and closing the UP or DOWN switch during the STATIC phases.

4.3-28 Flash Code F31: Reject Curve

1. The DYNAMIC pressure curve is unacceptable.
    - An initial pressure peak when the platform lifted cannot be found between 0% and 15% height. Check the pressure sensor and lift cylinder hydraulics.

4.3-29 Flash Code F32: Reject Curve

1. The DYNAMIC pressure curve is unacceptable.
    - There should be a lowest pressure about halfway through the lift (ie: near 50% height); the lowest pressure measured is at too low a height. Check the pressure sensor and lift cylinder hydraulics.

4.3-30 Flash Code F33: Reject Curve

1. The DYNAMIC pressure curve is unacceptable.
    - There should be a lowest pressure about halfway through the lift (ie: near 50% height); the lowest pressure measured is at too high a height. Check the pressure sensor and lift cylinder hydraulics.

4.3-31 Flash Code F34: Reject Curve

1. The DYNAMIC pressure curve is unacceptable.
    - There is not enough difference between the initial pressure peak and the minimum pressure. Check the pressure sensor and lift cylinder hydraulics.

4.3-32 Flash Code F40: Reject Delta

1. This message indicates that there is not enough difference between the loaded & empty pressure.

    This message could also occur if the wrong pressure sensor was fitted (eg: a 5000psi sensor when a 2000psi one is needed).

    This message could occur if the platform were not properly loaded during the STATIC LOADED phase, or if the platform were not properly empty during the STATIC EMPTY phase.
    - Check CALIBRATIONS / HEIGHT CALS; the “Height” indicates the first height at which there was insufficient difference and the “Up” and “Down” values show the loaded pressure (first) and the difference between loaded and empty pressure (second).

Load Sensing System - CE (Continued)

4.3-33 Flash Code F42: Low Pressure

1. This message indicates that the pressure is too low (0.5V or less) when the elevation switch opens during the DYNAMIC lift.

   This message would occur if the pressure sensor was disconnected, or if there were some other wiring error.
   - Check DIAGNOSTICS / SENSORS to check the pressure.

4.3-34 Flash Code F43: High Pressure

1. This message indicates that the pressure is too high (4.5V or more) when the elevation switch opens during the DYNAMIC lift.

   This message would occur if the pressure sensor was disconnected, or if there were some other wiring error.
   - Check DIAGNOSTICS / SENSORS to check the pressure.

4.3-35 Flash Code F44: Low Pressure

1. This message indicates that the pressure is too low (0.5V or less) at a STATIC measurement point.

   This message would occur if the pressure sensor was disconnected, or if there were some other wiring error.
   - Check DIAGNOSTICS / SENSORS to check the pressure.

4.3-36 Flash Code F45: High Pressure

1. This message indicates that the pressure is too high (4.5V or more) at a STATIC measurement point.

   This message would occur if the wrong pressure sensor was fitted, or if there were some other wiring error.
   - Check DIAGNOSTICS / SENSORS to check the pressure.

4.3-37 Flash Code F46: Check Elev

1. This message indicates that the elevation switch opened more than once during the DYNAMIC lift.

4.3-38 Flash Code F47: Check Elev

1. This message indicates that the elevation switch closed more than once during the DYNAMIC lower.

Section 5
PROCEDURES

Table of Contents

Service and Maintenance
General....3
Safety and Workmanship....3

Base
5.1-1 Hydraulic System and BrakeAdjustment Procedure (If Equipped) 3
5.1-2 Brake Assembly and Disassembly(If Equipped) 4
5.1-3 Holding Torque Testing Procedure 6
5.1-4 Winching and Towing Procedures and Brake System 6
5.1-5 System Lift and Pressure Adjustment....7
5.1-7 Wheel Bolt/Nut Inspection and Torquing Procedure 9
5.1-8 Wheel Reinstallation and Torquing Procedure 9
5.1-9 Front Axle Hub Procedure....10
5.1-10 Electronic Tilt Switch Setup Procedure....12
Tilt Switch Replacement....12
Reprogramming Existing Tilt Switch 14
Test and Verify Tilt Circuit 15

Engines
5.2-1 ECU Pin Reference Chart (GM) 16
5.2-2 Throttle Actuator (GM)....17
5.2-3 GM Map and IAT Sensor (GM)....18
5.2-4 Engine Coolant Temperature Sensor (GM) 19
5.2-5 LPG Temperature Sensor (GM)....20
5.2-6 Fuse Block Layout (GM)....21
5.2-7 Kubota Dual Fuel (DF972) Resistance Checks....22

Outriggers Option
5.3-1 Auto-Leveling Outrigger PC Board Layout 23
5.3-2 Outrigger Mechanical Limit Switch Wiring Diagram 24
5.3-3 Auto-Leveling Outrigger Setting and Error Codes....25
5.3-4 Auto-Leveling Outrigger Error Code Breakdown....26
5.3-5 Hand Held Calibration/Diagnostic Tool Key Functions....27
5.3-6 Outrigger Control Module Instructions 28
5.3-7 Auto-Leveling Outrigger Control Module Pin Reference Chart 31

Load Sensing System - CE
5.4-1 Control Module Pin Reference Chart....32
5.4-2 LED Error Codes - Quick Reference Chart....33
5.4-3 LED Error Codes - Code Breakdown Chart....34
5.4-6 Control Module Load Calibration - Code Messages & Definitions....36
5.4-7 Control Module Load Calibration Procedure....40
5.4-8 Curve/Group Codes Chart 44

General

The following information is provided to assist you in the use and application of servicing and maintenance procedures contained in this chapter.

Safety and Workmanship

Your safety, and that of others, is the first consideration when engaging in the maintenance of equipment. Always be conscious of weight. Never attempt to move heavy parts without the aid of a mechanical device. Do not allow heavy objects to rest in an unstable position. When raising a portion of the equipment, ensure that adequate support is provided.

Base

5.1-1 Hydraulic System and Brake Adjustment Procedure (If Equipped)

1. Ensure aerial platform is on a firm level surface and block wheels to prevent rolling in either direction.

2. Turn emergency main power disconnect switch to OFF position.

3. Locate brake manifold in hydraulic/electric side cabinet.

4. Depress and turn red knurled knob on brake valve counter-clockwise to a fully closed position or depress black knob (current manifold).

5. Grasp red plunger and rapidly depress until plunger can no longer be depressed and brake is fully released.

6. Inspect caliper and brake pads for binding. Pads should move freely on the pins.

7. Remove pin from brake cylinder clevis and brake actuating lever. Rotate actuating lever counter-clockwise to the end of its stroke.

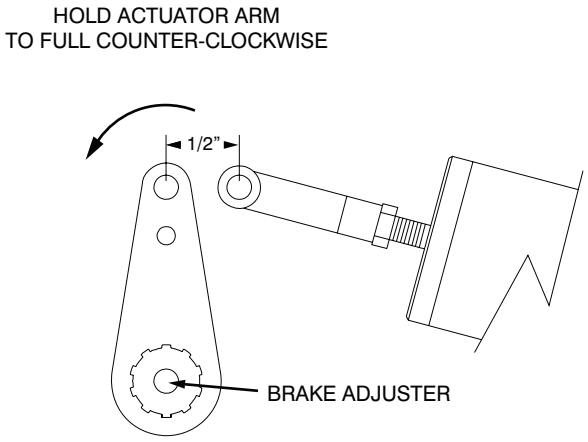


Diagram 5.1 Brake Adjustment

9. Reinstall clevis pin back into the clevis actuating lever.
10. Remove plastic plug located on the end of the caliper shaft. See Diagram 5.2.

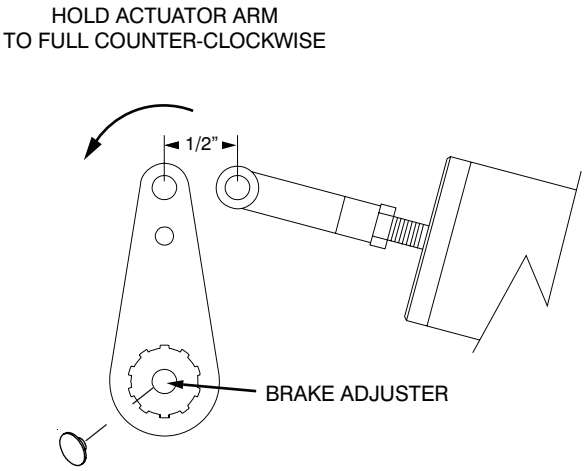


Diagram 5.2 Plug Removal and Replacement

11. Using a 1/4” Allen wrench, turn brake adjuster counter-clockwise until it bottoms out. Turn Allen wrench clockwise 1/2 turn clockwise to set adjustment.

12. Replace plastic plug back into the end of the caliper shaft.

13. Depress red knurled knob on brake valve and turn clockwise to a fully open position.

14. Remove Wheel blocks. Turn emergency main power disconnect switch to ON position. Operate drive several times to seat pads to brake disc.

5.1-2 Brake Assembly and Disassembly (If Equipped)

NOTE

This literature services various models in this brake series. The components shown in Diagram 5.3 may appear different than what is found in your brake.

Disassembly (Refer to Diagram 5.3)

1. Remove pressure plate from cover by removing cap screws.

CAUTION

Pressure plate is under spring tension of approximately 1633 kgf (3600 lb). The two cap screws must be loosened evenly to relieve this force. If a hydraulic press is available, 2041 kgf (4500 lb) minimum, the pressure plate can be held in position while removing the cap screws.

2. Remove case seal from cover.
3. Remove piston from pressure plate.
4. Remove o-rings and back-up rings from piston.
5. Before removing stator discs and rotor discs, record the stacking arrangement for reassembly purposes. Remove stator discs, rotor discs, return plate and shaft from cover.
6. Before removing springs, record the pattern and color for reassembly purposes. Remove dowel pins, springs and spring retainer from cover.
7. Press oil seal from cover.

Spring Chart			
Model	Yellow Spring (14)	Red Spring (14)	Blue Spring (14)
21-100-114	16	0	0

Assembly (Refer to Diagram 5.3)

1. Use an alkaline wash to clean parts before assembly.
2. Press new oil seal into cover until it is flush with bearing shoulder. Note direction of seal.
3. Install shaft, dowel pins, spring retainer and new spring in cover. Be sure to install springs according to pattern and color recorded during disassembly.
4. Position new return plate on springs.

NOTE

Be careful to avoid contaminating friction surfaces with oil.

5. Install new rotor discs and new stator discs in the same sequence as recorded during disassembly.
6. Install new back-up rings and new o-rings on piston. Note order of o-rings and back-up rings. Insert piston into pressure plate.
7. Install new case seal on cover.
8. Position pressure plate on cover aligning dowel pins with holes in pressure plate.
9. Install cap screws and tighten evenly to draw pressure plate to cover. Torque cap scerws 74.6 N-m (55 lb-ft).

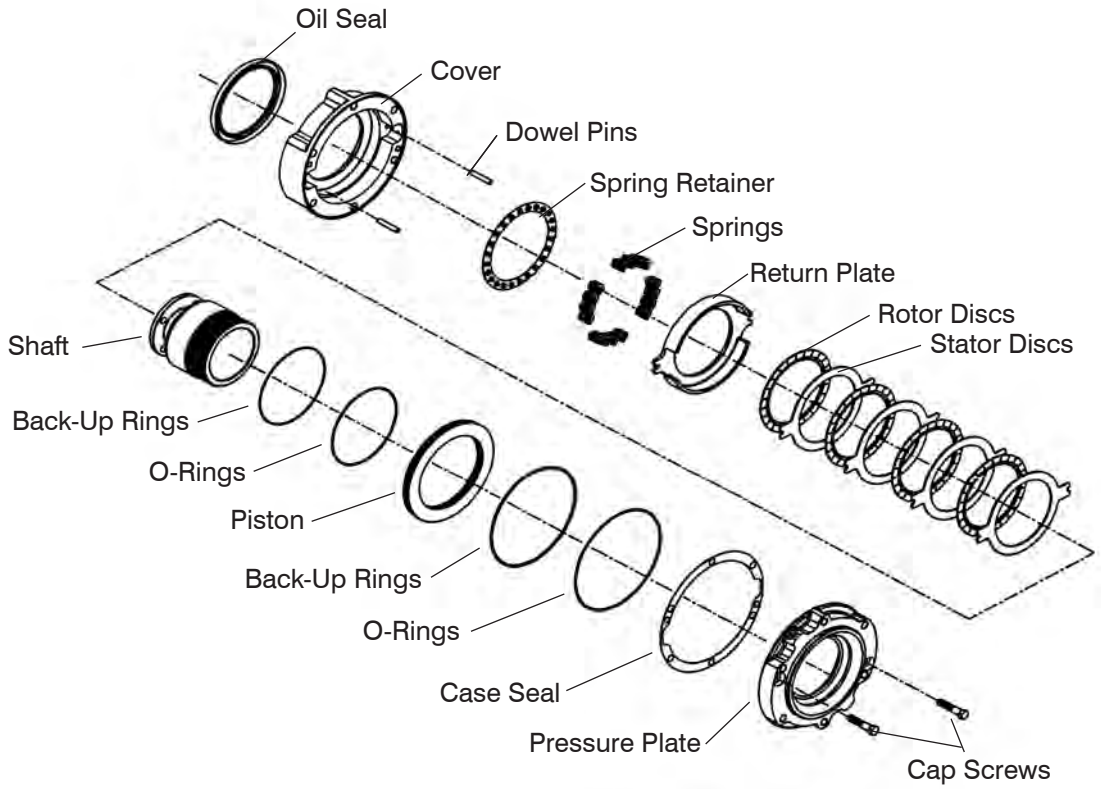
NOTE

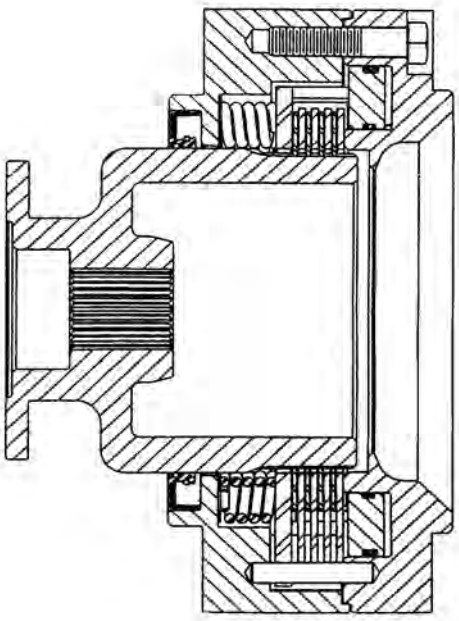
A hydraulic press will simplify installation of pressure plate on cover. Clamp pressure plate in position while tightening cap screws.

CAUTION

If hydrostatic testing is performed on brake assembly, release pressure must not exceed 69 bar (1000 psi) unless six additional bolts are used for supplemental clamping.

Diagram 5.3 Multiple Disc Brake Assembly





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5.1-3 Holding Torque Testing Procedure

1. Ensure aerial platform is on a firm level surface.

2. Locate brake feed valve (2H30A-2) on main manifold and disconnect electrical connectors from valve. This will prevent the hydraulic system from releasing the brake.

3. With engine running (aerial platform in drive mode, engine on high idle, high torque selected and low speed range selected), hold enable switch on controller and push controller forward as if you were to drive forward. This provides torque from the drive motor to unreleased brake.

4. If brake slips and aerial platform starts to move in this condition, either brake plates are worn or springs have broken. Both brake plates and springs must be replaced to return brake to its original holding torque.

5.1-4 Winching and Towing Procedures and Brake System

WARNING

When towing, do not drive onto a downward slope or brake the towing vehicle rapidly.

Disc Brake System

Diagram 5.4 Disc Brake System

Disc Brake -This device disengages the brake disc (1) when driving forward or in reverse. A hydraulic brake cylinder (2), linked to a disc caliper (3), engages and disengages a brake disc on the rear axle drive shaft yoke. The brake must be manually disengaged for pushing, towing or winching. Do not push or tow the work platform onto a downward slope or pull the platform down an incline towards the winch. The special procedure for manually disengaging the parking brake is as follows:

WARNING

Do not manually disengage parking brakes if work platform is on a slope.

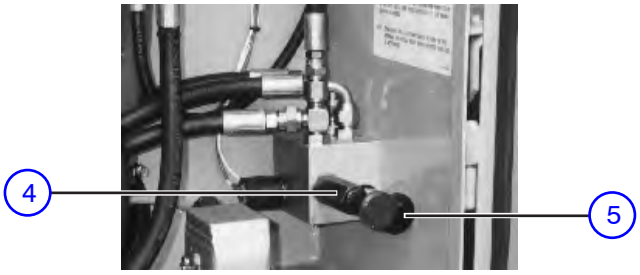


Diagram 5.5 Brake Release Hand Pump and Brake Valve Plunger

1. Ensure aerial platform is on a firm level surface.

2. Locate brake feed valve (2H30A-2) on main manifold and disconnect electrical connectors from valve. This will prevent the hydraulic system from releasing the brake.

3. With engine running (aerial platform in drive mode, engine on high idle, high torque selected and low speed range selected), hold enable switch on controller and push controller forward as if you were to drive forward. This provides torque from drive motor to unreleased brake.

4. If brake slips and aerial platform starts to move in this condition, either brake plates are worn or springs have broken. Both brake plates and springs must be replaced to return brake to its original holding torque.

5.1-5 System Lift and Pressure Adjustment

All adjustments must be made with a calibrated hydraulic gauge. Refer to the serial number nameplate located on the rear of the aerial platform for system and lift pressure values.

System Relief Pressure Adjustment

1. Locate right steer hydraulic line on main manifold. (Refer to Hydraulic Manifold Component and Port Identification found in Section 3 for location.)
2. Tee in a calibrated 3000 psi gauge into the right steer line.
3. Remove operator's control console from guardrail and disconnect it from scissors control cable.
4. Locate electrical panel cable plug in hydraulic/electric cabinet.
5. Disconnect scissors control cable and connect operator's control console cable.
6. At main manifold, loosen locknut on system relief valve (R1). (Refer to Hydraulic Manifold Component and Port Identification found in Section 3 for location.)
7. On platform control console, select "drive" position with lift/drive switch.
8. Engage right steer switch on top of controller handle and hold.
9. Observe reading on pressure gauge. Adjust system relief valve (R1) to pressure listed on the serial number nameplate.

NOTE

Turning the stem on relief valve clockwise will increases pressure. Turning the stem counter-clockwise will decreases pressure.

10. Release steer switch and retighten locknut on system relief valve (R1).
11. Remove gauge from steer line.

Lift Pressure Adjustment

WARNING

Fully lower the platform.

1. Locate lift line on main manifold. (Refer to Hydraulic Manifold Component and Port Identification found in Section 3 for location.)
2. Open manual lowering valve with platform fully lowered. Remove lift line from main manifold.
3. Install a 3000 psi gauge into lift line port fitting on main manifold. Plug lift line going to lift cylinders.
4. Loosen locknut on lift relief valve (R2). (Refer to Hydraulic Manifold Component and Port Identification found in Section 3 for location.)
5. Close the manual lowering valve.
6. Using base controls in hydraulic/electric cabinet, depress and hold up pushbutton switch.
7. Observe reading on pressure gauge. Adjust lift relief valve (R2) to pressure listed on the serial number nameplate.

NOTE

Turning the stem on relief valve clockwise will increases pressure. Turning the stem counter-clockwise will decreases pressure.

8. Release up pushbutton and retighten locknut on lift relief valve (R2).
9. Remove gauge from lift line port fitting and reconnect lift line to main manifold.

WARNING

Ensure aerial platform does not lift more than rated load.

5.1-6 Change Hydraulic Oil

NOTE

Samples of hydraulic oil should be drawn from the reservoir and tested annually. These samples should be taken when the oil is warmed through normal operation of the system. The sample should be analyzed by a qualified lubrication specialist to determine if it is suitable for continued use. Oil change intervals will depend on the care used in keeping the oil clean, and the operating conditions. Dirt and/or moisture cotamination will dictate that the oil should be changed more often. Under normal use and operating conditions, the hydraulic oil should be changed every two years. Refer to Table 1.2 of this manual.

1. Ensure aerial platform is on a firm level surface, fully lowered, and outriggers (if equipped) fully retracted.
2. Allow hydraulic oil to warm up.
3. Turn main power disconnect switch to off position.
4. Place suitable container under the hydraulic tank.
5. Remove oil drain plug and allow all hydraulic oil to drain into container.
6. Install oil drain plug with new seal ring and tighten firmly.
7. Refill hydraulic tank with new oil as per specifications. (Refer to section 2 of this manual)
8. Check for leakage.
9. Clean up any oil that may have spilled during this procedure.
10. Check hydraulic oil level. (The hydraulic oil level should be at or slightly above the top mark on the sight gauge)

NOTE

Refer to your national/local regulations on how to dispose of used filter and oil.v

5.1-7 Wheel Bolt/Nut Inspection and Torquing Procedure

It is necessary to check the torque on all wheel nuts and wheel bolts at pre-delivery, after 8 hours of operation and at weekly intervals using the following procedure:

1. Confirm that each wheel fastener is torqued to 140 ± 5 ft-lb. All fasteners must be torqued using the tightening sequence shown below.

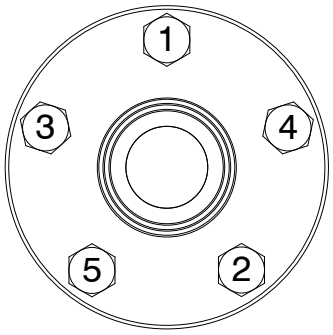


Diagram 5.4 Wheel Fastener Tightening Sequence

2. Again, confirm that each wheel fastener is torqued to the specified tolerance. Re-torque as necessary until all fasteners are properly torqued.

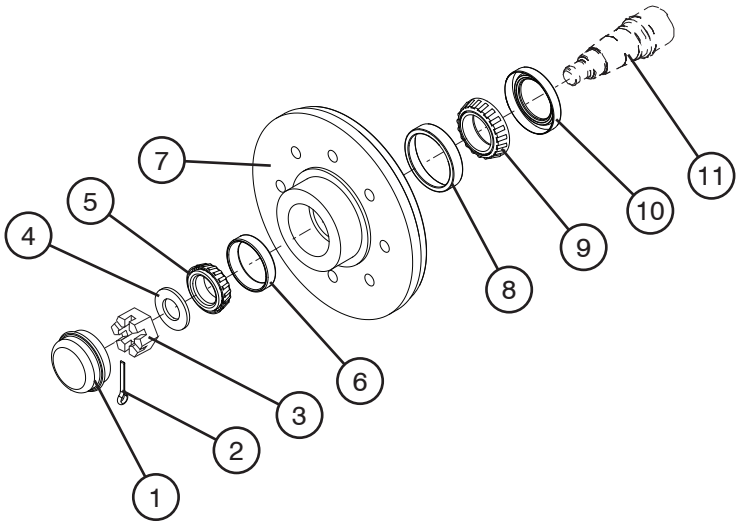
5.1-8 Wheel Reinstallation and Torquing Procedure

When a wheel/tire assembly has been removed or replaced, it will be necessary to follow the procedure below to ensure proper installation:

1. Inspect wheel fastener threads for damage of defects. Replace if defective.
2. Clean the mounting surfaces of the hub and wheel rim of debris, rust, excess paint, etc.
3. Mount wheel on the hub, centering mounting holes on the wheel studs or bolt holes. Use appropriate lifting device as required.
4. Install wheel nuts or wheel bolts and hand tighten to center the rim.
5. Torque nuts or bolts to approximately 50 ft-lb using the tightening sequence in procedure 5.1-7.
6. Torque again to 100 ft-lb using the same sequence.
7. Torque again to 140 ft-lb using the same sequence.
8. Repeat the tightening sequence to confirm that none have changed from 140 ft-lb. If any are found below 140 ft-lb, repeat complete sequence until there is no change in torque values. If possible, drive the machine prior to checking torques.
9. Check torque values after 8 hours of operation and then at weekly intervals.

5.1-9 Front Axle Hub Procedure

For front axle hub components, refer to your aerial platform's parts manual.



NOTE

Keep work area clean and visibly free from contamination at all times.

1. Ensure aerial platform is parked on a firm, level surface. Chock or block the wheels to keep the aerial platform from rolling forward or backward.
2. Fully lower the platform.
3. Using a suitable lifting device or outriggers (if equipped), lift the end of the aerial platform with the steer axle.

CAUTION

Use a suitably-rated support stand to support aerial platform while performing the following operations.

4. Turn emergency main power disconnect switch to "◯" off position.
5. Remove wheel assembly.
6. Remove dust cap (item 1) to access internal components of hub assembly.
7. Pull cotter pin (item 2) out of spindle arm (item 11) and then remove castle nut (item 3), washer (item 4) and outer bearing cone (item 5). Dispose of dust cap, cotter pin, castle nut, washer, and outer bearing cone.
8. Flip hub over and then remove and discard inner bearing cone (item 8) and grease seal (item 10).
9. Remove and discard both inner and outer bearing cups (items 6 & 8) from hub.
10. Remove grease from spindle arm and hub and look for signs of visible damage. If damage is found on the hub or on the spindle arm, contact Service Department immediately using information found in page 2 for further instructions.
11. Press new bearing cups (items 6 & 8) into hub.
12. Pack replacement inner and outer bearings by either pressing wheel bearing grease into each roller by hand or using a bearing packer and grease gun. Ensure that grease is forced into all surfaces of the bearing.

NOTE

Use only recommended wheel bearing grease - NLGI (National Lubricating Grease Institute) Grade #2 or equivalent.

NOTE

The bearings must be packed before installing.

13. Install replacement inner bearing in the race and then seat the new grease seal. Flip hub over and install replacement outer bearing.
14. Install hub on the spindle.
15. Install replacement washer and replacement castle flanged nut. Hand tighten the castle flanged nut until it touches the washer. Turn hub by hand to ensure smooth running. No resistance should be felt at this time.
16. Take a torque wrench and set it at 30 ft-lb, and while continuously rotating hub, tighten castle flanged nut. While hub is being turned and nut tightened, resistance will increase.
17. Using an open-ended wrench, loosen castle flanged nut a 1/4 turn while turning the wheel hub. It should turn easily. The nut should not come completely loose.
18. Using a torque wrench set to 15 ft-lb, tighten castle flanged nut. Turn wheel hub and check for smooth turning.

19. Check for alignment of the castle flanged nut with one of the cross holes in spindle arm. If required, loosen nut to align with nearest hole. Use an open-ended wrench to be able to see the cross holes. The nut should not be turned more than 15 degrees. Secure with new cotter pin. Check again for smooth turning of wheel hub. The wheel hub should turn but with slight resistance.

20. Grab the top and bottom of the hub and check for play. There should be no evidence of play.

21. Install dust cap back on hub assembly.

22. Install wheel assembly. Torque nuts or bolts to 140 ft-lb.

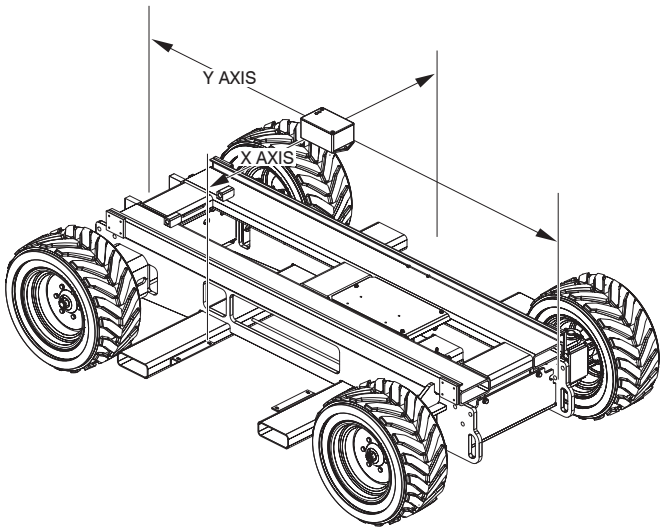
23. Repeat steps 5 to 22 for the other hub assembly.

24. Lower the aerial platform.

5.1-10 Electronic Tilt Switch Setup Procedure

The following information is supplied for replacement or reprogramming of the electronic tilt switch. Also included are test and verification instructions. Follow the appropriate procedures below.

Tilt Switch Replacement



1. Ensure aerial platform is parked on a firm level surface.
2. Fully lower the platform.
3. Chock or block wheels to keep the aerial platform from rolling forward or backward.
4. Push in "●" emergency stop buttons and turn main disconnect switch to "○" off position.
5. Disconnect tilt switch from 4 pin connector.

NOTE

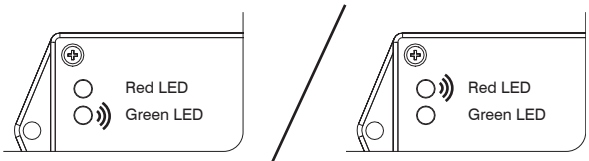
Ensure part number of old and new tilt switch are the same.

6. Remove old tilt switch from mount.
7. Install new switch to mount (in the same orientation as the old switch) and connect switch plug to 4 pin connector.

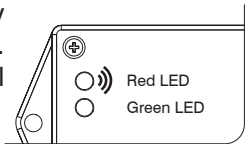
NOTE

The tilt circuit is only powered when controls are powered up.

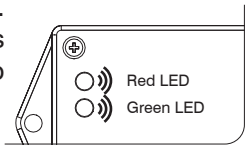
8. Turn main disconnect switch to "|" ON position.
9. Select off/lift/drive key switch to "↑↓" lift position or "↔" drive position.
10. Pull out "●" all emergency stop buttons.
11. Verify switch is powered. (Red or green LED will be continually blinking)



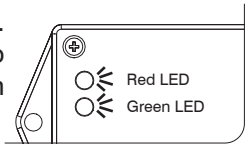
12. **Program the Tilt Switch**
    a. Press and release the set up button 3 times.
    b. Observe program delay / stabilization time. (Only the red LED will blink for 4 seconds)



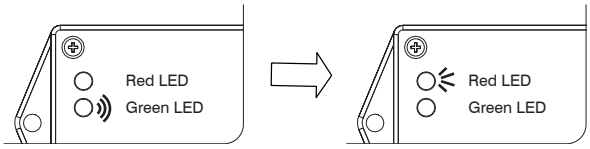
    c. Both LEDs will flash for 1 second. **Results:** The switch is learning the new zero position.



    d. Both LEDs will turn on solid for 1 second. **Results:** The new zero position has been learned.

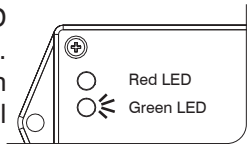


e. The green LED will flash and then the red LED will turn on solid for 2 seconds.



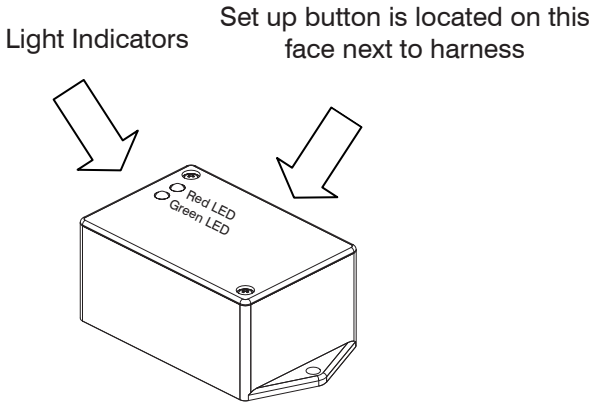
Results: The switch is verifying the new zero position.

f. The green LED will turn on solid. **Results:** The switch is ready for normal operation.



13. Turn main disconnect switch to "◯" off position
14. Push in " " emergency stop buttons.
15. Remove chock or wheel blocks.
16. Proceed to Test and Verify Tilt Circuit.

Reprogramming Existing Tilt Switch

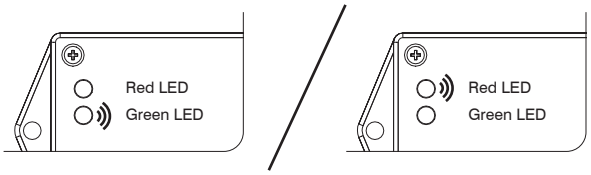


1. Ensure aerial platform is parked on a firm level surface.
2. Fully lower the platform.
3. Chock or block wheels to keep the aerial platform from rolling forward or backward.

NOTE

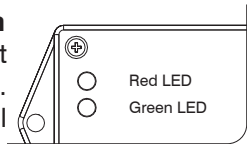
The tilt circuit is only powered when controls are powered up.

4. Turn main disconnect switch to "|" ON position.
5. Select off/lift/drive key switch to "↑↓" lift position or " " drive position.
6. Pull out " " all emergency stop buttons.
7. Verify switch is powered. (Red or green LED will be continually blinking)

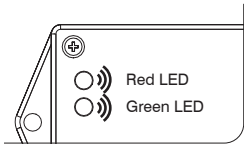


8. **Reprogram the Tilt Switch**

a. Press and hold the set up button for 3 seconds. **Results:** Both LEDs will be OFF.



b. Both LEDs will flash.



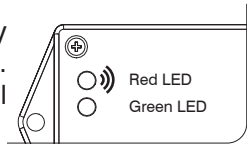
IMPORTANT

Step "c" must be completed within a 5 second period or the switch will automatically exit program mode and return to normal operation using previously stored data.

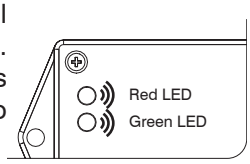
c. Press and release set up button 3 times.

d. If 5 second period has expired prior completion, repeat Step "a", "b" and "c".

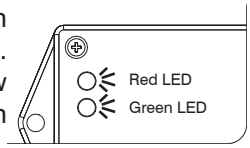
e. Observe program delay / stabilization time. (Only the red LED will blink for 4 seconds)



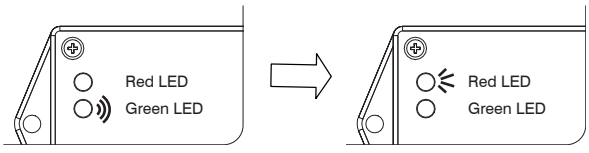
f. Both LEDs will flash for 1 second. **Results:** The switch is learning the new zero position.



g. Both LEDs will turn on solid for 1 second. **Results:** The new zero position has been learned.

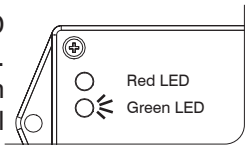


h. The green LED will flash and then the red LED will turn on solid for 2 seconds.



Results: The switch is verifying the new zero position.

i. The green LED will turn on solid. **Results:** The switch is ready for normal operation.

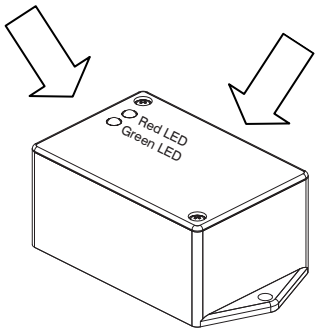


9. Turn main disconnect switch to "◯" off position.
10. Push in "🔴" emergency stop buttons.
11. Remove chock or wheel blocks.
12. Proceed to Test and Verify Tilt Circuit.

Test and Verify Tilt Circuit

Light Indicators

Set up button is located on this face next to harness



Operations of Tilt Switch

The following describes the LED's and what they indicate.

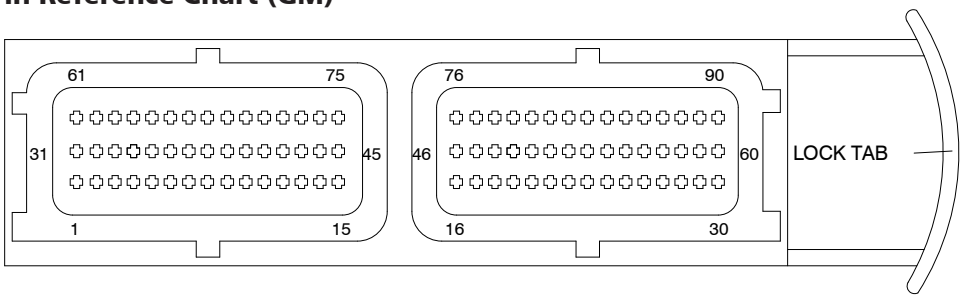
Green LED	Illuminated whenever both tilt axes are within the specified degrees of the zero/ home learned position. Flashes when transitioning in or out of tilt angle limits, but built in time delay has not fully occurred.
Red LED	Illuminated whenever tilt on one or more axes is more than the specified degrees out from the zero/ home position.
Green & Red LED	On together, no blinking when fault detected.

Tilt Circuit Test

1. Refer to section 2 for test tilt sensor procedure.

Engines

5.2-1 ECU Pin Reference Chart (GM)

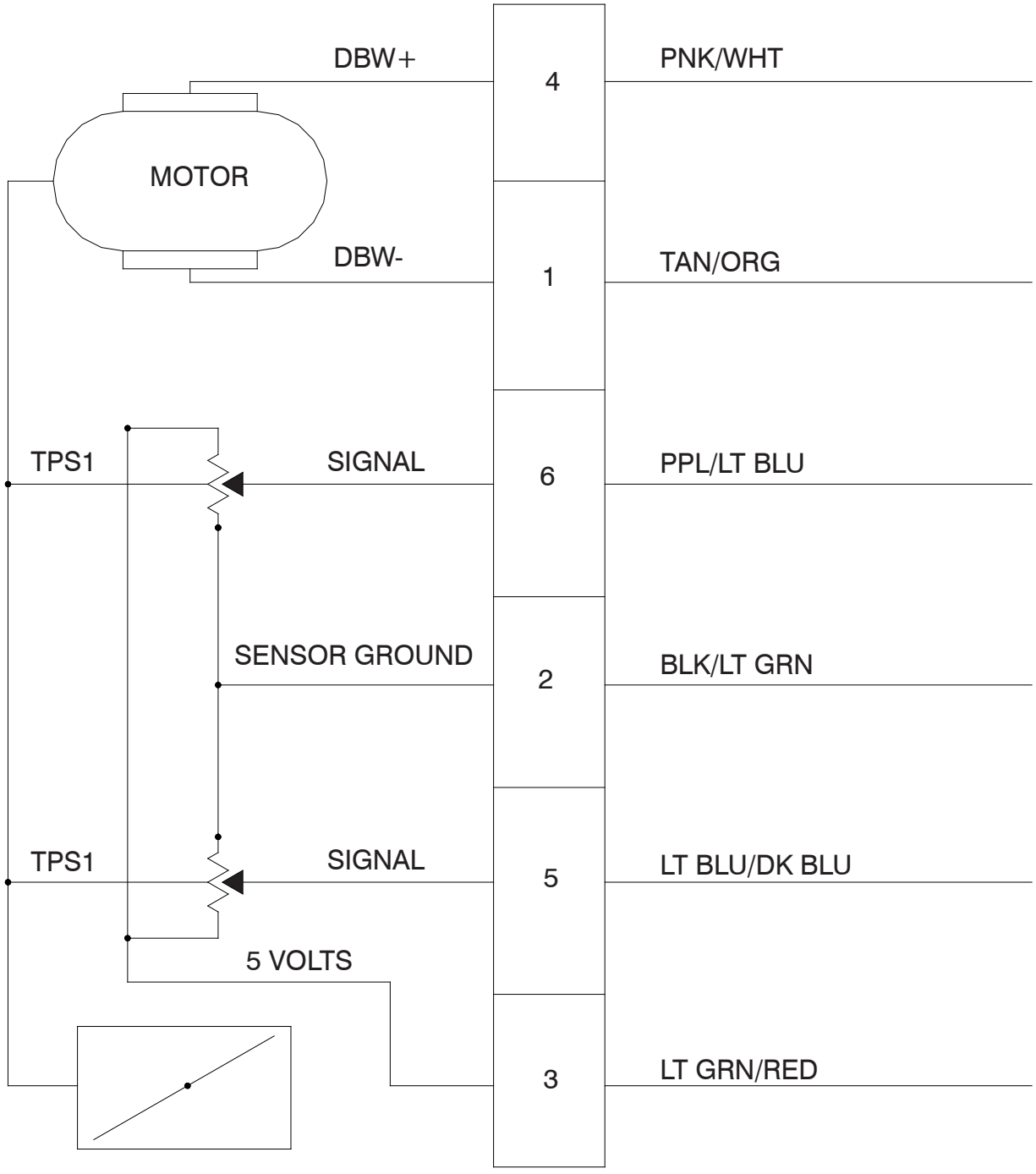


Diagnostics

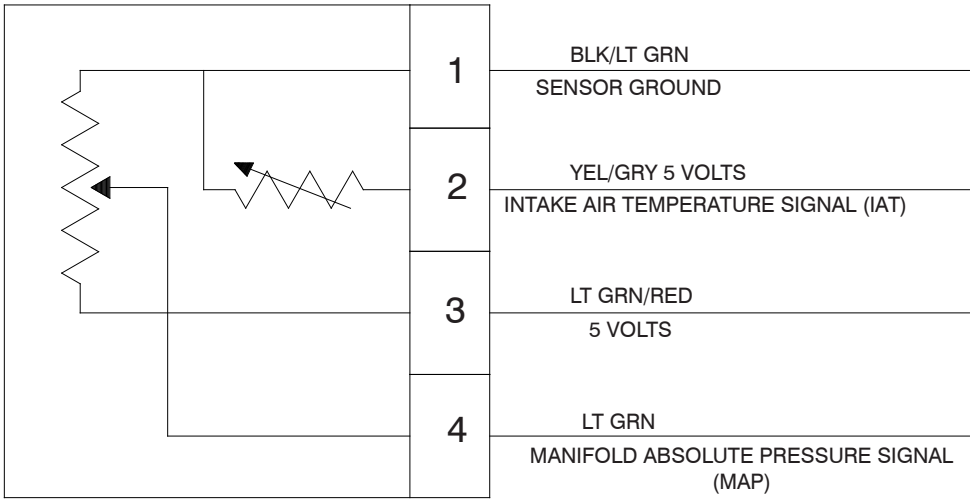
Pin #	Wire Color	Description	Pin #	Wire Color	Description
1	DK GRN/ORN	EGO1 Signal	46	DK BLU/YEL	Not used
2	DK GRN/WHT	EGO2 Signal	47	YEL/DK BLU	Not used
3	EMPTY		48	LT GRN/WHT	Output to gasoline temp sensor
4	EMPTY		49	LT GRN/PPL	Not used
5	PPL/LT BLUE	Throttle position 1 signal	50	LT GRN/BLK	Not used
6	LT BLU/DK BLU	Throttle position 2 signal	51	GRY/DK BLU	Mid throttle input
7	LT GRN	MAP Signal	52	GRY/ORN	High throttle input
8	TAN/DK GRN	Not Used	53	LT BLU	Input from oil pressure switch
9	DK BLU/ORN	Not Used	54	WHT/LT GRN	Signal from gasoline pressure sensor
10	PPL/YEL	Not Used	55	DK GRN	To diagnostic connector (PC)
11	EMPTY		56	ORN	To diagnostic connector (PC)
12	EMPTY		57	EMPTY	
13	WHT/ORN	Connected to pin #14 below	58	GRY	Not used
14	BLU/PNK	CAN + to propane regulator	59	EMPTY	
15	BLU/WHT	CAN – from propane regulator	60	RED/TAN	Battery positive
16	EMPTY		61	BRN/LT BLU	To injector #1 and #4
17	EMPTY		62	BRN/LT GRN	To injector #2 and #3
18	EMPTY		63	EMPTY	
19	LT GRN/RED	5 volt + from ECU to sensors	64	EMPTY	
20	BLK/LT GREEN	5 volt – to ECU from sensors	65	EMPTY	
21	PPL/WHT	+V from crank position sensor	66	EMPTY	
22	WHT/PPL	-V from crank position sensor	67	EMPTY	
23	EMPTY		68	EMPTY	
24	EMPTY		69	BLK	Ground from engine block
25	RED/WHT	Not used	70	EMPTY	
26	RED/BLK	Not used	71	WHT/LT BLU	Negative supply to power relay 2002CR
27	EMPTY		72	BLK/WHT	EGO 1 Heater ground
28	EMPTY		73	BLK/YEL	EGO 2 Heater ground
29	EMPTY		74	EMPTY	
30	EMPTY		75	WHT/BLK	Negative supply to propane lock off
31	YEL	Output to spark coil 1	76	EMPTY	
32	EMPTY		77	BRN/WHT	Negative supply to relay 10BCR2
33	YEL/RED	Output to spark coil 2	78	WHT/BRN	Not used
34	EMPTY		79	RED/TAN	Battery positive
35	EMPTY		80	GRN/YEL	To check engine light (MIL)
36	EMPTY		81	BLK	Ground from engine block
37	EMPTY		82	PNK/WHT	Positive to throttle actuator motor
38	EMPTY		83	TAN/ORN	Negative from throttle actuator motor
39	YEL/GRY	Output to IAT (part of MAP)	84	TAN/BLK	Negative supply to fuel pump relay 56CR
40	TAN/WHT	Output to ECT	85	PNK/YEL	Fuel pump excite wire
41	WHT/RED	Output to EGT	86	BLK/RED	Negative supply to fuel pump
42	TAN/BRN	Propane selected	87	TAN	Not used
43	TAN/RED	Not used	88	DK BLU	Not used
44	TAN/BLK	Not used	89	PNK/BLK	Negative supply to starter relay 32ACR
45	PNK/TAN	12 volt input	90	EMPTY	

60594AA

5.2-2 Throttle Actuator (GM)



5.2-3 GM Map and IAT Sensor (GM)

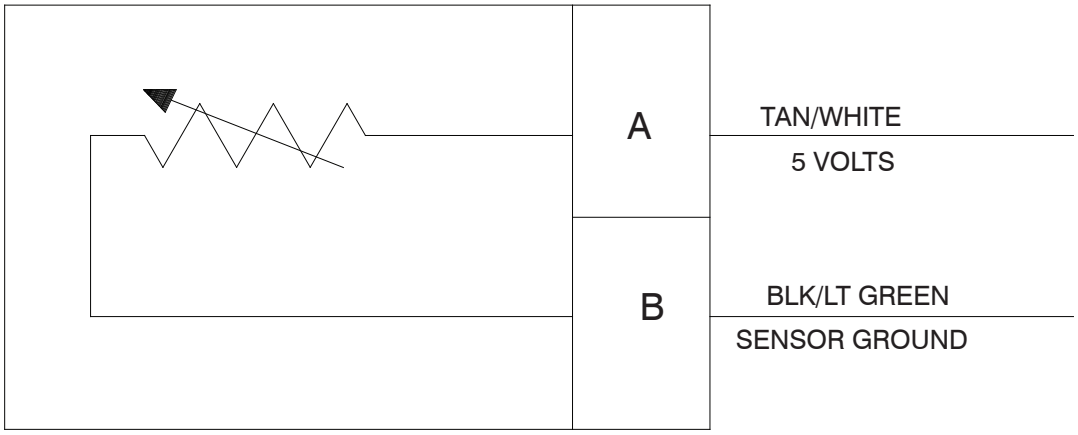


IAT Sensor Resistance

TEMPERATURE ° F	TOLERANCE ±10% OHMS
248	110
239	125
221	162
203	214
185	284
167	383
149	522
131	721
104	1,200
77	2,063
50	3,791
23	7,419
-4	15,614
-22	26,854
-31	35,763
-40	48,153

60597AA

5.2-4 Engine Coolant Temperature Sensor (GM)

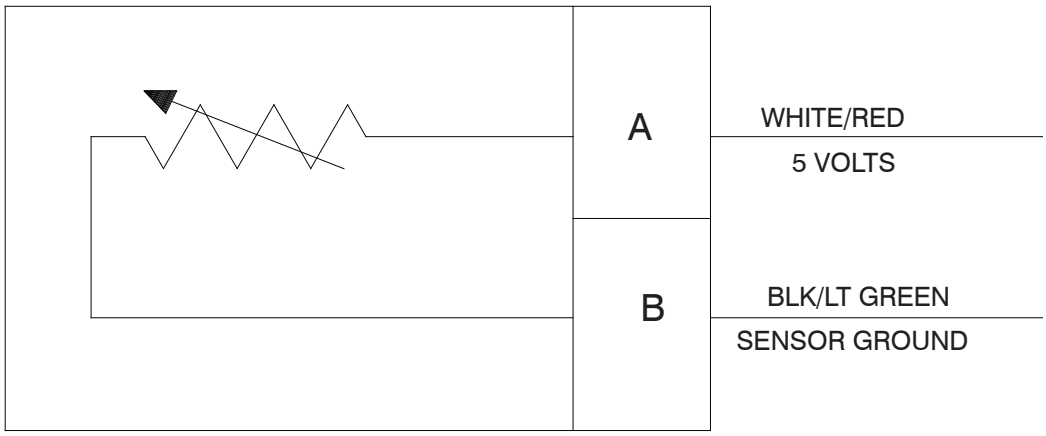


Temperature Sensor Resistance

TEMPERATURE ° F	TOLERANCE ±10% OHMS
242.4	101
231.9	121
211.6	175
201.4	209
181.9	302
163.1	434
144.9	625
127.4	901
102.4	1,556
78.9	2,689
49.9	5,576
23.5	11,562
-5.7	28,770
-21.7	49,715
-30.8	71,589
-40	99,301

60595AA

5.2-5 LPG Temperature Sensor (GM)



Temperature Sensor Resistance

TEMPERATURE DEGREES F	TOLERANCE ±10% OHMS
220	153.7
200	214.6
190	255.4
180	305.5
170	367.3
160	444.1
140	660.6
120	1008
100	1582
80	2554
70	3284
60	4259
40	7357
20	13214
0	24705
-20	48300
-40	99318

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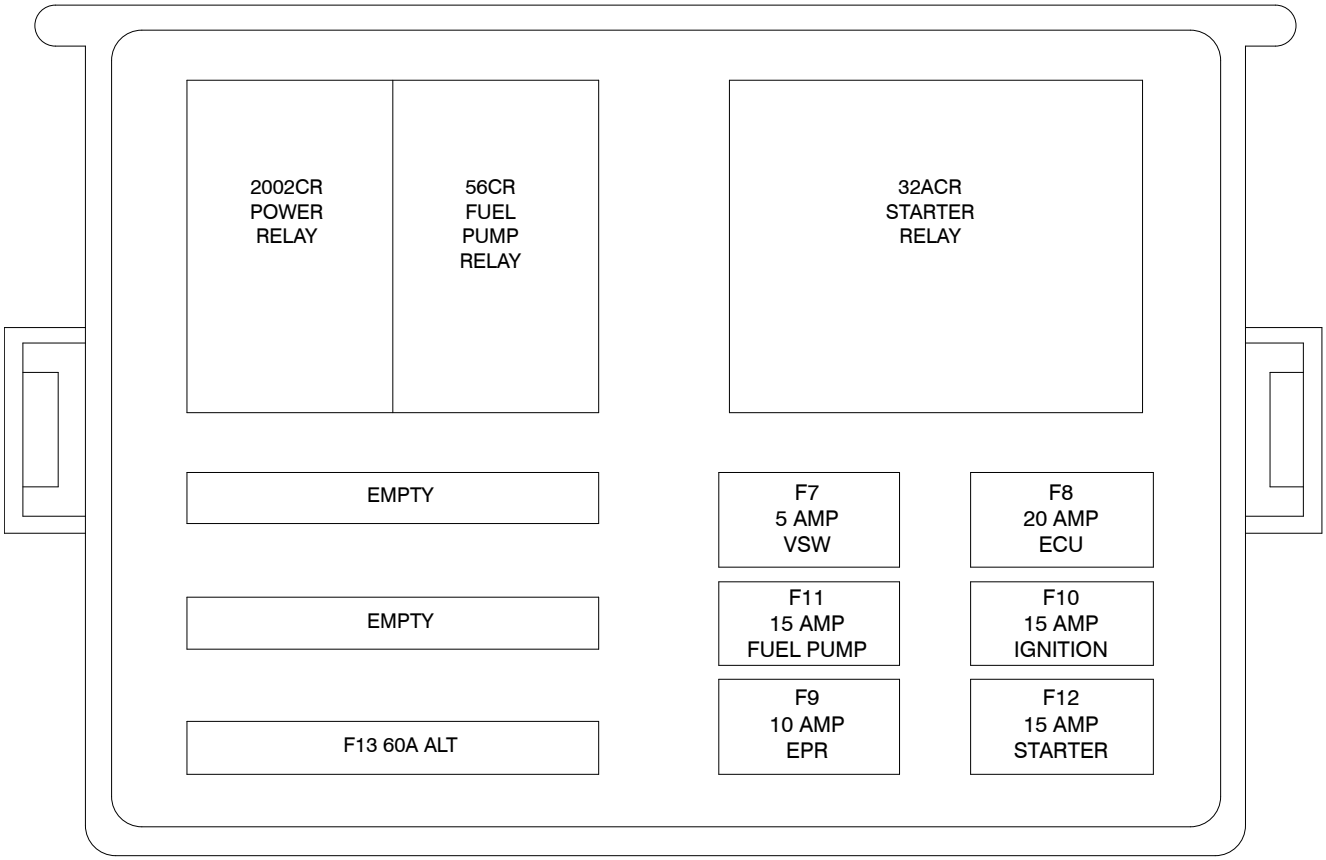
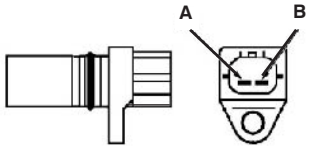
5.2-6 Fuse Block Layout (GM)



5.2-7 Kubota Dual Fuel (DF972) Resistance Checks

Resistance of Pick-Up Sensor

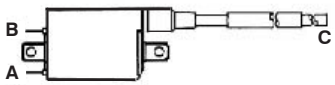
1. Disconnect connector from sensor.
2. Measure the resistance with an ohmmeter.
3. If resistance is not within factory specifications, replace it.



Resistance	Factory Specification	**A - B**	1.85 to 2.45kΩ at 20°C

Resistance of Ignition Coil

1. Disconnect connector from ignition coil.
2. Measure the resistance with an ohmmeter.
3. If resistance is not within factory specifications, replace it.

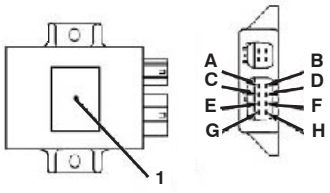


Resistance	Factory Specification	**A - B**	1.87 to 2.53Ω at 20°C
		A - C	10.4 to 15.6Ω at 20°C

A: Terminal (+) C: High Tension Cord
B: Terminal (-)

Resistance of Ignitor

1. Disconnect connector from ignitor.
2. Measure the resistance with an ohmmeter.
3. If resistance is not within the factory specifications, replace it.



IMPORTANT

To replace the ignitor with a service part, make sure the ignitor has the same part cord No / ID mark as the old one. (See the information label #1.)

Ignitor Check Chart

Negative Positive	A	B	C	D	E	F	G	H
A		10 to 40 kΩ	10 to 40 kΩ	11 to 47 kΩ	infinity	infinity	infinity	infinity
B	10 to 40 kΩ		0.33 to 1.3 kΩ	1.8 to 7.3 kΩ	infinity	infinity	infinity	infinity
C	10 to 40 kΩ	0.33 to 1.3 kΩ		1.5 to 6.0 kΩ	infinity	infinity	infinity	infinity
D	11 to 47 kΩ	1.8 to 7.3 kΩ	1.5 to 6.0 kΩ		infinity	infinity	infinity	infinity
E	infinity	infinity	infinity	infinity		infinity	infinity	infinity
F	2 megohm (minimum)	2 megohm (minimum)	2 megohm (minimum)	2 megohm (minimum)	infinity		infinity	infinity
G	2 megohm (minimum)	2 megohm (minimum)	2 megohm (minimum)	2 megohm (minimum)	infinity	infinity		infinity
H	2 megohm (minimum)	2 megohm (minimum)	2 megohm (minimum)	2 megohm (minimum)	infinity	infinity	infinity	

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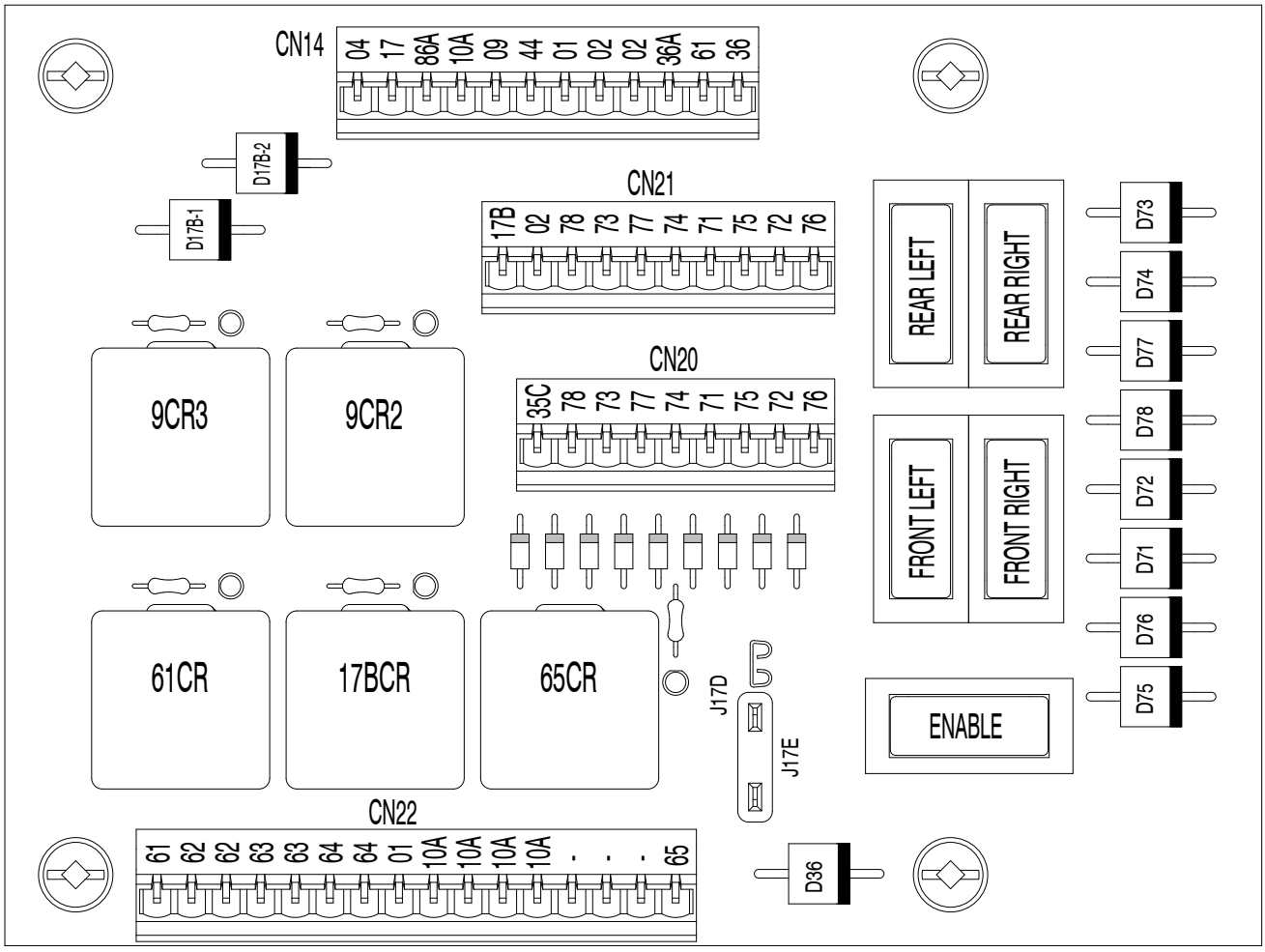
Outrigger Option

5.3-1 Auto-Leveling Outrigger PC Board Layout



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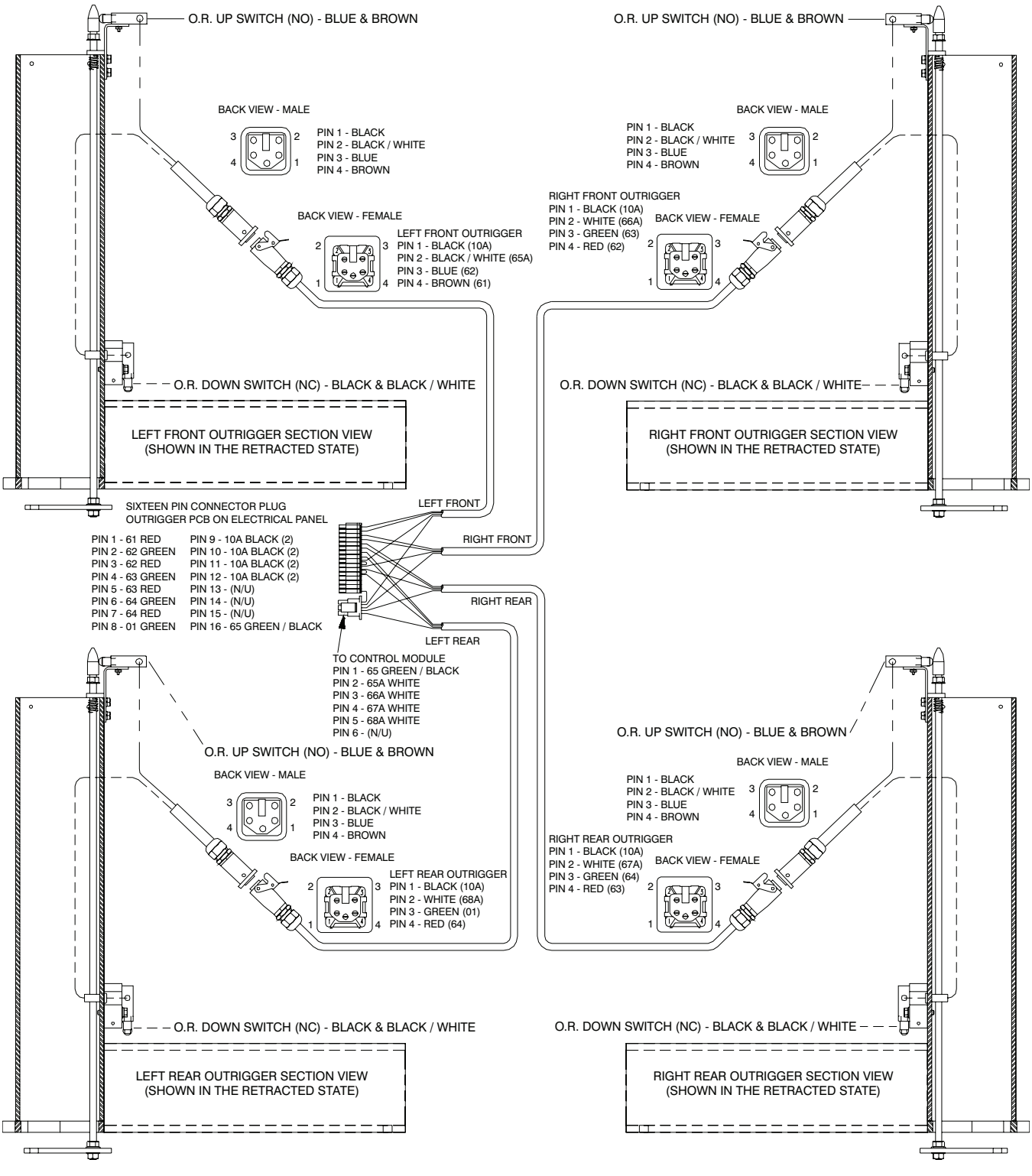
5.3-2 Outrigger Mechanical Limit Switch Wiring Diagram


O.R. UP SWITCH (NO) - BLUE & BROWN
BACK VIEW - MALE
PIN 1 - BLACK
PIN 2 - BLACK / WHITE
PIN 3 - BLUE
PIN 4 - BROWN
BACK VIEW - FEMALE
LEFT FRONT OUTRIGGER
PIN 1 - BLACK (10A)
PIN 2 - BLACK / WHITE (65A)
PIN 3 - BLUE (62)
PIN 4 - BROWN (61)
O.R. DOWN SWITCH (NC) - BLACK & BLACK / WHITE
LEFT FRONT OUTRIGGER SECTION VIEW
(SHOWN IN THE RETRACTED STATE)
O.R. UP SWITCH (NO) - BLUE & BROWN
BACK VIEW - MALE
PIN 1 - BLACK
PIN 2 - BLACK / WHITE
PIN 3 - BLUE
PIN 4 - BROWN
RIGHT FRONT OUTRIGGER
PIN 1 - BLACK (10A)
PIN 2 - WHITE (66A)
PIN 3 - GREEN (63)
PIN 4 - RED (62)
BACK VIEW - FEMALE
O.R. DOWN SWITCH (NC) - BLACK & BLACK / WHITE
RIGHT FRONT OUTRIGGER SECTION VIEW
(SHOWN IN THE RETRACTED STATE)
SIXTEEN PIN CONNECTOR PLUG
OUTRIGGER PCB ON ELECTRICAL PANEL
PIN 1 - 61 RED
PIN 2 - 62 GREEN
PIN 3 - 62 RED
PIN 4 - 63 GREEN
PIN 5 - 63 RED
PIN 6 - 64 GREEN
PIN 7 - 64 RED
PIN 8 - 01 GREEN
PIN 9 - 10A BLACK (2)
PIN 10 - 10A BLACK (2)
PIN 11 - 10A BLACK (2)
PIN 12 - 10A BLACK (2)
PIN 13 - (N/U)
PIN 14 - (N/U)
PIN 15 - (N/U)
PIN 16 - 65 GREEN / BLACK
LEFT FRONT
RIGHT FRONT
RIGHT REAR
LEFT REAR
TO CONTROL MODULE
PIN 1 - 65 GREEN / BLACK
PIN 2 - 65A WHITE
PIN 3 - 66A WHITE
PIN 4 - 67A WHITE
PIN 5 - 68A WHITE
PIN 6 - (N/U)
O.R. UP SWITCH (NO) - BLUE & BROWN
BACK VIEW - MALE
PIN 1 - BLACK
PIN 2 - BLACK / WHITE
PIN 3 - BLUE
PIN 4 - BROWN
BACK VIEW - FEMALE
LEFT REAR OUTRIGGER
PIN 1 - BLACK (10A)
PIN 2 - WHITE (68A)
PIN 3 - GREEN (01)
PIN 4 - RED (64)
O.R. DOWN SWITCH (NC) - BLACK & BLACK / WHITE
LEFT REAR OUTRIGGER SECTION VIEW
(SHOWN IN THE RETRACTED STATE)
O.R. UP SWITCH (NO) - BLUE & BROWN
BACK VIEW - MALE
PIN 1 - BLACK
PIN 2 - BLACK / WHITE
PIN 3 - BLUE
PIN 4 - BROWN
RIGHT REAR OUTRIGGER
PIN 1 - BLACK (10A)
PIN 2 - WHITE (67A)
PIN 3 - GREEN (64)
PIN 4 - RED (63)
BACK VIEW - FEMALE
O.R. DOWN SWITCH (NC) - BLACK & BLACK / WHITE
RIGHT REAR OUTRIGGER SECTION VIEW
(SHOWN IN THE RETRACTED STATE)

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5.3-3 Auto-Leveling Outrigger Setting and Error Codes

Reading the Codes:
In order to read the fault codes, a sequence of pauses and flashes can be seen on the LED mounted on the outrigger control module. The codes are continuously displayed by the LED until the fault is cleared, the outrigger control module is reset and no longer detects the fault, or idle timeout becomes active.

The sequence is as follows:
1. Half second flashes followed by half second pauses indicate the first digit.
2. A 2.5 second pause.
3. Half second flashes followed by half second pauses indicate the second digit
4. A 5 second pause.

Repeat steps 1-4

Since the outrigger control module only reports one error, only one code can be read from the LED per instance. If the error is cleared and another error is present, it will then be presented.

LED Error Codes

EVERYTHING OK	ON
VEHICLE TILTED	1/1
OUTRIGGERS CANNOT BE MOVED!	1/2
OUTRIGGERS NOT HOME	2/2
NOT FULLY LEVEL	2/1
RELEASE OUTRIGGER DEMAND!	5/5
CHECK OUTRIGGER SUPPLY (P4-9)	5/2
CANNOT LEVEL : BAD TILT SENSOR	7/1
OUTRIGGERS MANUALLY CONTROLLED!	6/6
TESTING HWFS	7/8
B+ SUPPLY TOO LOW	5/1
STARTUP!	7/7
FAULT: BAD SLAVE MICRO	7/5
FAULT: BAD TILT SENSOR	7/1
FAULT: BAD HWFS	7/2
FAULT: P2-5 FAULTY	8/1
FAULT: P2-6 FAULTY	8/2
FAULT: P2-8 STUCK ON	8/3
FAULT: P2-8 ALWAYS ON	8/4
FAULT: P2-8 ALWAYS OFF	8/5
FAULT: HWFS STALLED!	7/6

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5.3-4 Auto-Leveling Outrigger Error Code Breakdown

RELEASE OUTRIGGER DEMAND!	5/5
Check inputs on P2 pins 5 & 6 - the “auto-level” or “auto-retract” input is active at power-on or when it is not allowed to carry out the function.	

OUTRIGGERS CANNOT BE MOVED!	1/2
Check input on P2 pin 10 – “auto-level” or “auto-retract” has been requested but the platform is elevated.	

NOT FULLY LEVEL	2/1
The outrigger legs are all down (touching the ground) but the platform is not fully level.	

OUTRIGGERS NOT HOME	2/2
The outrigger legs are not all down (touching the ground) and also are not all home (fully retracted).	

B+ SUPPLY TOO LOW	5/1
CHECK OUTRIGGER SUPPLY (P4-9)	5/2
Check that the battery voltage is not too low.	

VEHICLE TILTED	1/1
These is not a true fault – move the vehicle to level ground!	

TESTING HWFS	7/8
STARTUP!	7/7
These are not true faults unless they do not clear – the start-up tests should only occur for a short time.	

OUTRIGGERS MANUALLY CONTROLLED!	6/6
This is not a true fault – the outriggers are being manually operated (one or more outrigger legs on P4 pins 1-8 is high, when the outrigger control module is not active.	

CANNOT LEVEL (BAD TILT SENSOR)	7/1
FAULT: BAD TILT SENSOR	7/1
FAULT: BAD HWFS	7/2
FAULT: BAD SLAVE MICRO	7/5
FAULT: HWFS STALLED!	7/6
FAULT: P2-5 FAULTY	8/1
FAULT: P2-6 FAULTY	8/2
FAULT: P2-8 STUCK ON	8/3
FAULT: P2-8 ALWAYS ON	8/4
FAULT: P2-8 ALWAYS OFF	8/5
These are internal faults. If the fault persists after the power has been reset, the outrigger control module may need to be replaced.	

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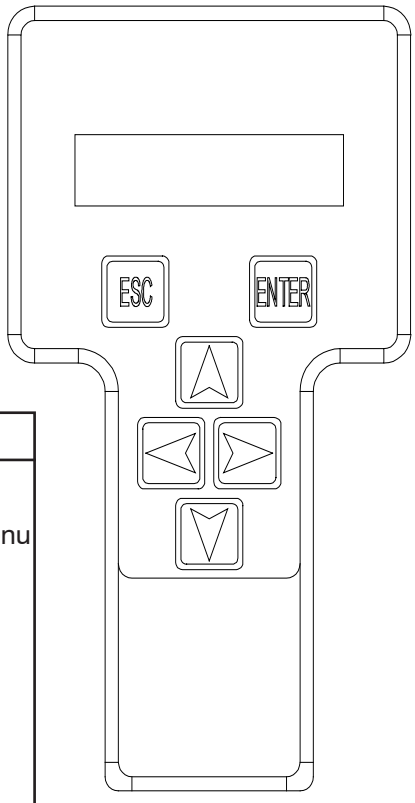
5.3-5 Hand Held Calibration/Diagnostic Tool Key Functions

WARNING

Only trained and authorized personnel shall be permitted to service an aerial platform.

WARNING

Read all instructions closely before attempting each phase of this procedure.



SYMBOL	KEY FUNCTIONS
ESC ENTER	**ESC/ENTER BUTTONS** To move back and forth between menu and sub-menu
◁ ▷	**LEFT/RIGHT BUTTONS** Select menus and setting to be adjusted
△ ▽	**UP/DOWN BUTTONS** Adjust setting values

Outrigger Settings

Model	9241	9250
O.R. Setting	8	5

5.3-6 Outrigger Control Module Instructions

When EZcal hand-held device is connected to the OCM1 control module, a two line displays shows various menus and settings. At any time the top line of the display describes the currently selected menu and the bottom line shows the currently selected item in that menu.

Six buttons on **EZcal** allow easy navigation through the menus:

- ← and → change the selected item (the bottom line display)
- ENTER enters the selected new menu when available (top line display changes)
- ↑ and ↓ adjusts the selected item when available
- ESC exits the current menu back to the previous menu

TOP LEVEL MENU OPTIONS

HELP	Select this menu to see a description of current OCM1 status
DIAGNOSTICS	Select this menu to see switch input status & logged data
ACCESS LEVEL	Select this menu & enter correct code to enable adjustments and calibrations
ADJUSTMENTS	Select this menu to see and adjust OCM1 settings NOTE: this menu provides for adjustments which might be needed for different work activities
SETUPS	Select this menu to carry out initial set-up of the OCM1 NOTE: this menu provides for set-ups which are needed to configure the OCM1 for a particular vehicle

HELP MENU OPTIONS

(help message)	A message displays current OCM1 status, indicating if everything is OK or if there is an error code (see LED Error Codes - Table 5.3)

DIAGNOSTIC MENU OPTIONS

SYSTEM	Select this menu to see general OCM1 system information
SWITCHES	Select this menu to see switch input status
OUTPUTS	Select this menu to see OCM1 output status
LOG	Select this menu to see logged information

DIAGNOSTIC / SYSTEM MENU OPTIONS

OUTRIGGERS	Displays various status during the auto-level function
TILT	Displays vehicle tilt in “X” and “Y” orientations measured by integral sensor
TILTED	Displays whether vehicle is tilted (YES or NO)
BATTERY	Displays battery supply voltage (on P2-12)

DIAGNOSTIC / SWITCHES MENU OPTIONS

LR/P2-1	High when the left rear outrigger is in contact with the ground
RR/P2-2	High when the right rear outrigger is in contact with the ground
RF/P2-3	High when the right front outrigger is in contact with the ground
LF/P2-4	High when the left front outrigger is in contact with the ground
EXTEND/P2-5	High to activate the auto-level function
RETRACT/P2-6	High to activate the auto-retract function
ELEV/P2-10	High when the scissor stack is stowed (“elevated” input indicates that the vehicle is stowed).

DIAGNOSTIC / OUTPUTS MENU OPTIONS

LAMP/P2-7	Displays state of outrigger control box light
STABLE/P2-8	Displays state of stable (all legs touching the ground) output
TILT/P2-9	Displays state of tilt
LRe/P4-1	Displays state of left rear outrigger extend valve
RRe/P4-2	Displays state of right rear outrigger extend valve
RFe/P4-3	Displays state of right front outrigger extend valve
LFe/P4-4	Displays state of left front outrigger extend valve
LRr/P4-5	Displays state of left rear outrigger retract valve
RRr/P4-6	Displays state of right rear outrigger retract valve
RFr/P4-7	Displays state of right front outrigger retract valve
LFr/P4-8	Displays state of left front outrigger retract valve
P4-9 MON	Displays the voltage to the outrigger valve (can only be seen when operating in auto-level or retract)

DIAGNOSTIC / LOG MENU OPTIONS

MAX.BATTERY	Displays maximum recorded battery supply voltage
OCM1 version	Displays part number and software version of GP106
EZcal version	Displays software version of EZcal

ACCESS LEVEL MENU OPTIONS

CODE xxxx	"ACCESS LEVEL" 3 (allows viewing only) "ACCESS LEVEL" 2 (allows setup on OCM1)

ADJUSTMENTS MENU OPTIONS (factory set - not adjustable)

Xtilt TRIP	Displays the tilt trip point in the "X" orientation
Ytilt TRIP	Displays the tilt trip point in the "Y" orientation
TILT ENTRY	Displays the tilt delay time
TILT EXIT	Displays the tilt delay time
Xlevel TRIP	Displays the tilt trip point in the "X" orientation during the auto-level function
Ylevel TRIP	Displays the tilt trip point in the "Y" orientation which applies during the auto-level function

MACHINE SETUP MENU OPTIONS (factory set - not adjustable)

DEFAULTS	Allows all adjustments & machine settings to be set to defaults WARNING: all GP106 settings will be changed; use with caution!
CALIBRATE LEVEL	Allows levelling of the integral tilt sensor of the GP106, when the vehicle is positioned on level ground (see Appendix Four)
TILT MODE	Allows configuration of the GP106 tilt output (P2-9): 1 – output turns on to light lamp when tilted 2 – output turns off to cutout functions when tilted 3 – output turns off to cutout functions when tilted AND elevated
TILT FILTER	Displays the filter applied to the tilt measurements during the auto-level function (used to minimize the effect of vehicle vibrations on the tilt measurement)
Xlevel TARGET	Displays the tilt in the "X" orientation at which the auto-level function will complete.
Ylevel TARGET	Displays the tilt in the "Y" orientation at which the auto-level function will complete.
tilt SLACK	Displays the amount of vehicle tilt exceeding the Xtilt TARGET and/or Ytilt TARGET in which the auto-level function will not attempt to level EXAMPLE: Xtilt TARGET=0.3°, Ytilt TARGET=0.7°, tilt SLACK=0.5° If machine is tilted to 1.0° in the X and Y orientations, the auto-level function will attempt to level the X orientation (0.3+0.5<1.0) but will not attempt to level the Y orientation (0.7+0.5>1.0) RANGE: 0.0° to 1.0°, default 0.3°

IMPORTANT

Each phase must be completed before the next phase can be carried out.
All phases must be completed before the aerial platform can be operated.
Always follow the instructions of the Calibration instrument.

1. Ensure aerial platform is parked on a firm and level surface.

2. Elevate the scissors high enough to lay a level accross the base tubes. Ensure there is no debris on the base and the level sits flat. Do not elevate aerial platform higher than the high speed/tilt override limit switch.

3. Manually operate the outriggers and level the machine in 4 places: left side, right side, front and rear. All 4 outriggers must be firmly placed and all 4 tires are off the ground.

4. Double check that the aerial platform is level at all 4 points.

5. Connect the EZcal tool to the P1 connector on the **CONTROL MODULE**.

6. The display will show "**Help: Press Enter**".
   By using Left/Right buttons, select the "**Access Level (3)**" from the menu and press the **ENTER** button.

7. The display will show "**Access Level: Code (0000)**".
   By using the Up/Down buttons, enter the Access Level Code (1 ➔1 ➔ 2 ➔ 2) followed by pressing the **ENTER** button.

8. The display will show "**Access Level 2**".
   By using Left/Right buttons, select the "**Setups**" from the menu and press the **ENTER** button.

9. The display will show "**Setups: Change Defaults**".
   Select the "**Change Defaults**" from the menu and press the **ENTER** button.

10. The display will show "**Defaults, 0 = Custom**".
    By using Up/Down buttons, select the "Defaults: Code Setting for your Model (For Default Code Refer to Table 5-3)" from the menu and press the **ENTER** button and followed by **ESCAPE** button.

11. The display will show "**Setups Change Defaults**".
    By using Left/Right buttons, select the "**Calibrate Level**" from the menu and press the **ENTER**.

12. The display will show "**Calibrate Level: Yes: Enter, No: ESC**".
    Select the "**Yes**" from the menu by press the **ENTER** button.

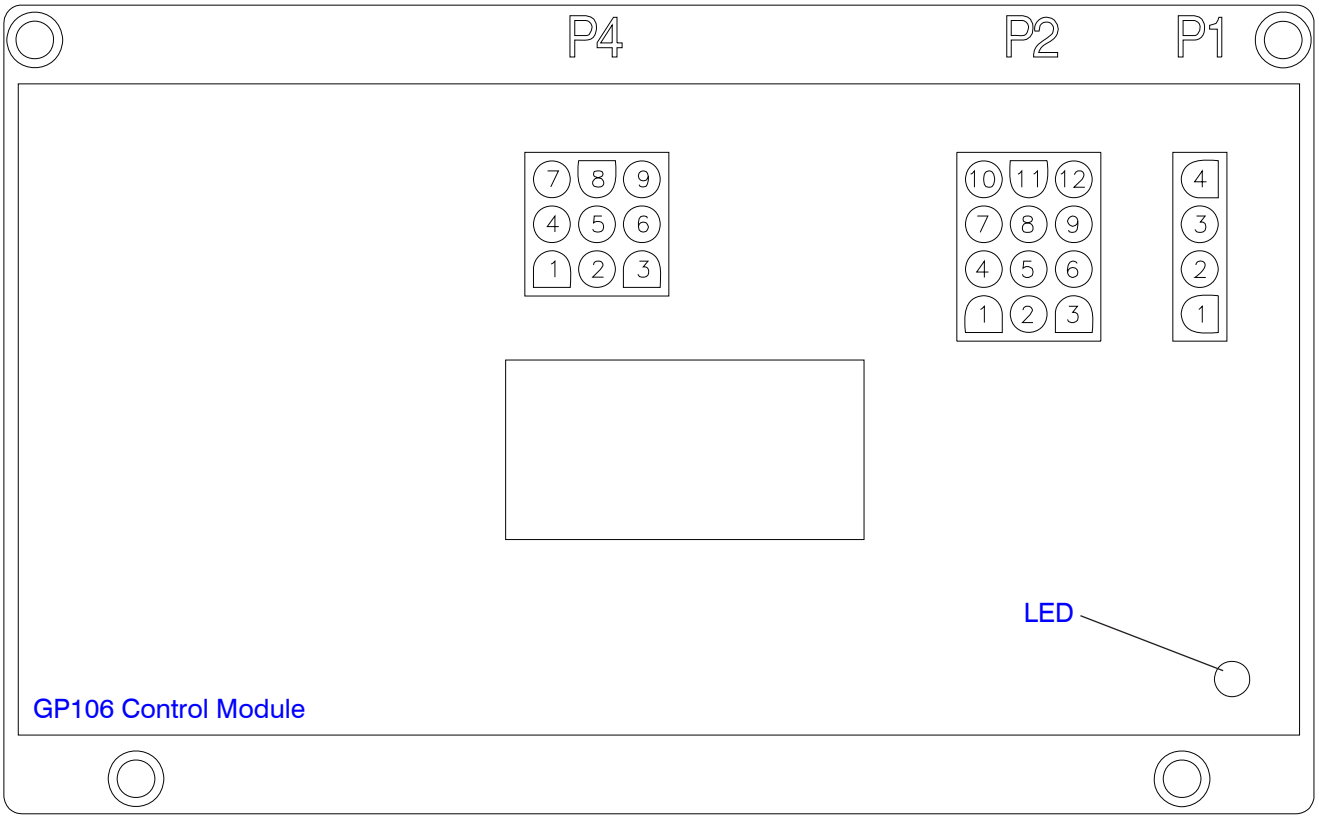
13. The display will show "**Calibrate Level: Tilt 0.0' , 0.0'**".
    Select the "**ESCAPE**" from the menu once.

14. The display will show "**Setups Calibrate Level**".
    Select the "**ESCAPE**" from the menu once again.

15. The Calibration procedure is complete, unplug and remove the EZ-Cal.

16. Close the hydraulic/electric cabinet.

5.3-7 Auto-Leveling Outrigger Control Module Pin Reference Chart



PLUG	PIN #	WIRE # AND CO-LOUR	WIRE FUNCTION
P1	The Calibration Connection		
P2	1	68A White	Input indicating that the LEFT REAR outrigger is in contact with the ground
P2	2	67A Red/White	Input indicating that the RIGHT REAR outrigger is in contact with the ground
P2	3	66A Blue/White	Input indicating that the RIGHT FRONT outrigger is in contact with the ground
P2	4	65A Green/White	Input indicating that the LEFT FRONT outrigger is in contact with the ground
P2	5	70 Green/Black	Input for AUTO-LEVEL function to extend the outriggers to level the machine
P2	6	79 Green	Input for AUTO-RETRACT function to retract the outriggers until the switch is released
P2	7	70A Red/White	Outrigger Light on Outrigger Control Box
P2	8	65 Green/Black	STABLE output to indicate that all outriggers are in contact with the ground
P2	9	28 Green	TILT output to indicate that the machine is level (ANSI/CSA only)
P2	10	35 Green	Tilt override / High Drive Cutout
P2	11	02 White	Negative Input
P2	12	10A Black	Main Power Input
P4	1	78 Black/White	Output used to extend the LEFT REAR outrigger
P4	2	77 Blue/Black	Output used to extend the RIGHT REAR outrigger
P4	3	76 Red/Black	Output used to extend the RIGHT FRONT outrigger
P4	4	75 Orange/Black	Output used to extend the LEFT FRONT outrigger
P4	5	74 Black	Output used to retract the LEFT REAR outrigger
P4	6	73 Blue	Output used to retract the RIGHT REAR outrigger
P4	7	72 Red	Output used to retract the RIGHT FRONT outrigger
P4	8	71 Orange	Output used to retract the LEFT FRONT outrigger
P4	9	35C White/Black	Power input for outriggers

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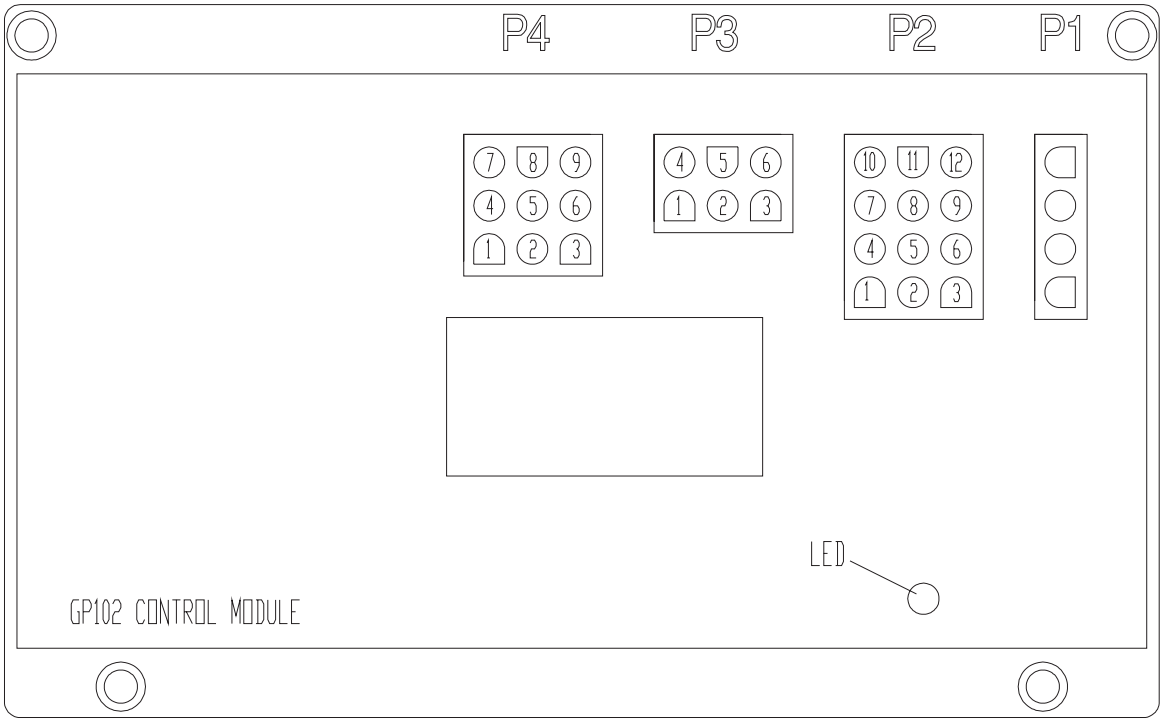
Load Sensing System - CE

5.4-1 Control Module Pin Reference Chart



PLUG	PIN #	WIRE # AND COLOUR	WIRE FUNCTION
P1	The Calibration Connection		
P2	1	Not Used	Not Used
P2	2	10E Black/White	Input Power From Base Terminal Strip To Confirm Lower Control Is Selected
P2	3	14D Black	Raise Platform Input
P2	4	13D Orange	Lower Platform Input
P2	5	Not Used	Not Used
P2	6	Not Used	Not Used
P2	7	16 White/Black	Forward Direction Input
P2	8	15 Blue	Reverse Direction Input
P2	9	Not Used	Not Used
P2	10	35B Red/Black	Input From LS1 High Speed Limit Switch To Verify ON/OFF Limits
P2	11	02 White	Negative Input From Base Terminal Strip
P2	12	10C Red	Main Power Input From Base Terminal Strip
P3	1	22 Red	Output To FL-22 Flashing Light
P3	2	29 Black	Output To BP-29 Beeper
P3	3	60 Black/White	Output To Overload Warning Light On Control Box
P3	4	28 Green/Black	Output To 28CR1 Tilt Relay And 28CR2 Down Relay
P3	5	02 White	Negative for Flashing Light and Beeper
P3	6	28E Green/White	Output To 28ECR1 Aux. Tilt Relay And 28ECR2 Aux. Down Relay
P4	1	Not Used	Not Used
P4	2	60A Green	Varied Input From Transducer
P4	3	28B Green	Varied Input From Angle Transducer
P4	4	Not Used	Not Used
P4	5	Not Used	Not Used
P4	6	910 Black	Positive Signal To Angle Transducer
P4	7	902 White	Negative Signal To Angle Transducer
P4	8	900 White	Negative Signal To Pressure Transducer
P4	9	910 Black	Positive Signal To Pressure Transducer

60303AD

5.4-2 LED Error Codes - Quick Reference Chart

HELP Message	LED indication
EVERYTHING OK	Steady on
IN GROUND MODE!	Steady on
OVERLOAD FUNCTIONS DISABLED!	6/6
VEHICLE TILTED	1/1
VEHICLE OVERLOADED	1/2
WAITING FOR B+ ON P2-12	5/2
ARMGUARD ACTIVE!	1/3
TOO HIGH - DRIVE PREVENTED	1/4
TOO HIGH - LIFT UP PREVENTED	1/5
TESTING HWFS	7/8
IDLE TIMEOUT ACTIVE!	Always off
WAITING FOR NEUTRAL	5/5
ELEVATION SWITCH SHIFTED?	2/1
ELEVATION SWITCH STUCK?	2/2
NO LAST CALDATE!	6/3
LOAD NOT CALIBRATED	6/2
DRIVE/LIFT INPUTS FAULTY!	5/6
UP/DOWN SELECT INPUTS ACTIVE TOGETHER	5/4
INVALID LOAD - CHECK SENSORS	6/4
HEIGHT NOT CALIBRATED	6/1
INVALID HEIGHT - CHECK SENSOR	6/5
EMS INPUTS FAULTY!	5/2
B+ SUPPLY TOO LOW	5/1
P4-1 OR P5-1 SHORT TO 0V?	4/1
P3-4 SHORT TO SUPPLY!	4/2
P3-4 SHORT TO 0V?	4/3
P3-4 SHORT TO SUPPLY?	4/4
P3-6 SHORT TO 0V?	4/5
P3-6 SHORT TO SUPPLY?	4/6
FAULT: BAD TILT SENSOR	7/1
FAULT: BAD HWFS	7/2
FAULT: BAD SLAVE ANALOGS	7/3
FAULT: BAD STRAIN MONITORS	7/4
FAULT: BAD SLAVE MICRO	7/5
FAULT: HWFS STALLED!	7/6
STARTUP!	7/7
FACTORY OVERRIDE	6/7

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Reading the Codes:
In order to read the fault codes, a sequence of pauses and flashes can be seen on the LED mounted on the GP102 module. The codes are continuously displayed by the LED until the fault is cleared, the GP102 reset and no longer detects the fault, or idle timeout becomes active.

The sequence is as follows:
1. Quarter second flashes followed by quarter second pauses indicate the first digit.

2. A 1.5 second pause.

3. Quarter second flashes followed by quarter second pauses indicate the second digit

4. A 4 second pause. Repeat steps 1-4

Since the GP102 only reports one error, only one code can be read from the LED per instance. If the error is cleared and another error is present, it will then be presented.

5.4-3 LED Error Codes - Code Breakdown Chart

Diagnostic sequence dependant on LED flash code:

No Last Caldate	63
Load Not Calibrated	62
Height Not Calibration	61

An EZcal is required!

Waiting For Neutral	55
Drive/Lift Inputs Faulty!	56
Up/Down Select Inputs Active Together	54
EMS Inputs Faulty!	52

Check inputs on P2 pins 1,2,3,4,5,6,7,8.

P3-4 Short To Supply!	42
P3-4 Short To Supply?	44
P3-6 Short To Supply?	46

Disconnect plug P3. If fault clears there is a problem with the wiring from P3-4 or P3-6 to the rest of the vehicle.

Armguard Active!	23
Elevation Switch Shifted?	21
Elevation Switch Stuck?	22

If the 23 flash code is triggered by armguard, it will occur once then clean. This is not a true fault but just an indication of the reason for the vehicle stop. If the 21 or 22 flash code is triggered by a fault with the elevation switch, it will not clear. Check that the elevation switch correctly opens/closes when the platform is raised/lowered.

P3-4 Short To 0V?	43
P3-6 Short To 0V?	45

Disconnect plug P3. If fault clears there is a wiring fault from P3-4 or P3-6 to the rest of the vehicle.

Invalid Load - Check Sensors	45

Check the voltage out of the pressure transducer, into P4-2. It should be between 0.5V (zero pressure) and 4.5V (maximum pressure) and should vary as the platform load & position varies.

Waiting For B+ on P2-12	52
B+ Supply Too Low	51
P4-1 Or P5-1 Short To 0V?	41

Check that the battery voltage is not too low.
Verify battery voltage on P2-12.
Disconnect plug P4 – if the fault clears there is a wiring fault from P4-1 to the rest of the vehicle.

5.4-4 LED Error Codes - Code Breakdown Chart (Continued)

Vehicle Tilted	11
Vehicle Overloaded	12
Too High - Drive Prevented	14
Too High - Lift Up Prevented	15

These are not true faults but an indication that vehicle movement is prevented. Remove excessive load from the platform. Lower the platform if close to maximum height. Move the vehicle to level ground.

Invalid Height - Check Sensor	65

Check the voltage out of the height transducer, into P4-3. It should be between .4V and 4.6V and should vary as the platform position varies.

Testing HWFS	78
Start Up!	77

These are not true faults unless they do not clear – the start-up tests should only occur for a short time.

Overload Functions Disabled!	66
Factory Override	67

These are not true faults – the GP102 has been configured to suppress overload functionality.

Idle Timeout Active!	Always Off
Fault: Bad Tilt Sensor	71
Fault: Bad HWFS	72
Fault: Bad Slave Analogs	73
Fault: Bad Strain Monitors	74
Fault: Bad Slave Micro	75
Fault HWFS Stalled!	76

Action a function to clear the idle timeout if it occurred. Ensure the GP102 is correctly mounted – incorrect mounting can cause the “bad tilt sensor” diagnostic to occur. Otherwise there may be an internal problem with the GP102.

5.4-6 Control Module Load Calibration - Code Messages & Definitions

During calibration the following failure message may appear:
(Refer to 5.3-6 for hand held calibration/diagnostic tool key functions)

F01: Check HWFS
- This message is given if the GP102 startup tests have not completed. Check HELP message for more information.

F02: Not Ground Mode
- This message is given if the machine is not in ground mode (P2-2 must be high).Calibration can only be carried out in ground mode.

F03: Not Stopped
- This message is given if any function switch is closed. Check DIAGNOSTICS / SWITCHES to see which function switch is closed.

F04: Tilted
- This message is given if the machine is tilted. Calibration must be carried out with the machine level. If the machine is level, use the SETUPS / TILT SETUPS to set the GP102 level.

F05: Bad Height
- This message is given if the height sensor output (P4-3) is out of range at the start of calibration. The height sensor output must be between 0.9V and 4.1V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

F06: Check Elev
- This message is given if the elevation switch (P210) is open at the start of calibration, when the operator has confirmed the “PLATFORM DOWN?” question. If the platform is down, check the elevation switch wiring.

F08: Check Elev
- This message is given if the elevation switch (P2-10) is closed at the end of calibration, when the platform should be fully raised. This message would occur if the UP switch was accidentally opened near the start of the lift. If the platform is fully raised, check the elevation switch wiring.

F09: Bad Height
- This message is given if the height sensor output (P4-3) is out of range at the start of calibration. The height sensor output must be between 0.9V and 4.1V. Check DIAGNOSTICS / SENSORS to see the output.

F10: Bad Height
- This message is given if the height sensor output (P4-3) is out of range at the end of calibration. The height sensor output must be between 0.9V and 4.1V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

F11: Not Up
- This message occurs at the start of calibration if the operator selects a function other than UP.

F13: Low Height Range

- This message occurs at the end of calibration if the height sensor output did not change sufficiently to give a reasonably accurate platform height estimate. DIAGNOSTICS / SENSORS can be used to check the height sensor output (P43) when the platform is fully lowered and fully raised; a difference of at least 1V is to be expected. This message could occur if the UP switch was accidentally opened too early (when the platform is not fully raised).

F15: Check Elev

- This message is given if the elevation switch (P2-10) is open when the platform has been fully lowered at the end of calibration. This message would occur if the DOWN switch was accidentally opened before the platform was fully lowered. If the platform is fully lowered, check the elevation switch.

F16: Low Elev.open

- This message is given if the elevation switch (P2 10) opened during lift at a too low height (below 5%). Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

F17: High Elev.open

- This message is given if the elevation switch (P210) opened during lift at a too high height (above 25%).Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

F18: Low Elev.close

- This message is given if the elevation switch (P210) closed during lower at a too low height (below 5%).Check CALIBRATIONS / HEIGHT CALS; the “ElevDown” value shows the recorded height where the switch opened.

F19: High Elev.close

- This message is given if the elevation switch (P210) closed during lower at a too high height (above 25%).Check CALIBRATIONS / HEIGHT CALS; the “ElevUp” value shows the recorded height where the switch opened.

F20: Height<>0%

- This message occurs if the platform height is not 0% after the platform has been fully lowered at the end of calibration.The platform must return to the same height each time it is fully lowered. Check DIAGNOSTICS / SYSTEM to check the height.

F28: Bad Height

- This message indicates a problem with the height sensor output (P43) during calibration. The height sensor output must be between 0.9V and 4.1V during calibration and between 0.4v and 4.6v during normal operation. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

F42: Low Pressure

- This message indicates that the pressure is too low (0.5V or less) when the elevation switch opens during calibration. Check DIAGNOSTICS / SENSORS to check the pressure.

F43: High Pressure

- This message indicates that the pressure is too high (4.5V or more) when the elevation switch opens during calibration. Check DIAGNOSTICS / SENSORS to check the pressure.

F44: Low Pressure
- This message indicates that the pressure is too low (0.5V or less) at a measurement point. Check DIAGNOSTICS / SENSORS to check the pressure.

F45: High Pressure
- This message indicates that the pressure is too high (4.5V or more) at a measurement point. Check DIAGNOSTICS / SENSORS to check the pressure.

F46: Check Elev
- This message indicates that the elevation switch opened more than once during calibration lifting.

F47: Check Elev
- This message indicates that the elevation switch closed more than once during calibration lowering.

F48: Bad Pressure
- This message is given if the pressure sensor output (P4-2) is out of range at the start of calibration. The height sensor output must be between 0.5V and 4.5V. Check DIAGNOSTICS / SENSORS to see the output. A reading of 0V or 5V is probably due to a wiring problem.

F52: Too Few!
- This message indicates that not enough measurements were recorded during calibration lifting or lowering.

F98: Out of Range
- This message indicates that the “fine tune” calibration is unacceptable. This probably is due to the wrong load being in the platform (i.e: specifying “EMPTY” if the platform is loaded, or the other way round) or (Having the incorrect pressure transducer installed).

During calibration the following information messages may appear:

Caldate:
- This message is prompting for the date to be entered; it is stored to identify when the machine was calibrated. The last calibrate date can be viewed in DIAGNOSTICS / LOG. Press LEFT & RIGHT to select the flashing digits. Press UP & DOWN to change the flashing digits. Press ENTER when the entry is complete. IMPORTANT: The date 00/00/00 is not allowed!

Finished
- This message confirms that calibration is complete and successful.

Lift Empty
- This message is displayed while the platform is being raised to the next measurement height, when an EMPTY platform is being calibrated.

Lift Loaded
- This message is displayed while the platform is being raised to the next measurement height, when a LOADED platform is being calibrated.

Lifting
- This message is displayed while the platform is being raised, during HEIGHT-only calibration.

Lower Empty
- This message is displayed while the platform is being lowered to the next measurement height, when an EMPTY platform is being calibrated.

Lower Loaded
- This message is displayed while the platform is being lowered to the next measurement height, when an EMPTY platform is being calibrated.

Lowering
- This message is displayed while the platform is being lowered, during HEIGHT-only calibration.

Measuring #
- This message is displayed when the platform is stopped during calibration, when the GP102 takes a measurement. There will be a short delay while the machine is allowed to stabilize after movement is stopped.

Must Go Down!
- This message occurs if the wrong switch is closed when the GP102 is waiting for the platform to be lowered.

Must Go Up!
- This message occurs if the wrong switch is closed when the GP102 is waiting for the platform to be raised.

Platform Down?
- This message is prompting for confirmation that the platform is fully lowered. If necessary the DOWN switch can be activated to lower the platform. Press ENTER to confirm when the platform is fully lowered.

Platform Empty?
- This message is prompting for confirmation that the platform is completely empty.Press ENTER to confirm if the platform is empty.

Platform Loaded?
- This message is prompting for confirmation that the platform is loaded to rated load Press ENTER to confirm if the platform is loaded.

Please Lift
- This message is prompting for the platform to be raised. The UP switch should be closed.

Please Lower
- This message is prompting for the platform to be lowered. The DOWN switch should be closed.

Please Wait
- This message indicates that the GP102 is busy; the delay will be short (no more than 5s).

Total Data:
- This message is displayed at the end of each phase, to confirm the number of measurements recorded by the GP102.

5.4-7 Control Module Load Calibration Procedure

1. Move the aerial platform to a test area where the platform can be elevated to its maximum working height and reach.

2. Ensure the aerial platform is parked on a firm, level surface.

IMPORTANT

Each phase must be completed before the next phase can be carried out.
All phases must be completed before the aerial platform can be operated.

IMPORTANT

Always follow the instructions of the Calibration instrument.

IMPORTANT

Make sure the aerial platform is on BASE mode.

NOTE

To ensure a good and clear contact, clean the wire terminals before attaching the jumper clip.

3. Locate the main manifold inside the hydraulic/electric tray.

4. Disconnect the black wire #14 from the lift coil.

5. Locate the contactor on the electrical panel assembly.

6. The jumper connection must be connected between the contractor (wire #19B) and the lift coil (instead of the black wire #14)

7. Connect the Easy-Cal tool to the P1 connector on the CONTROL MODULE.

8. The display will show "**Help: Press Enter**".
   By using Left/Right buttons, select the "Access Level (?)" from the menu and press the **ENTER** button.

Contact Skyjack Service Department at:
(44) 1691-676 236 for your Access Level Code Number.

9. The display will show "**Access Level Code (xxxx)**".
   By using the Up/Down buttons, enter the Access Level Code (xxxx) followed by pressing the **ENTER** button.

10. The display will show "**Access Level 2**".
    By using Left/Right buttons, select the "Setups" from the menu and press the **ENTER** button.

11. The display will show "**Machine Defaults**".
    Select the "Machine Defaults" from the menu and press the **ENTER** button.

12. The display will show "**Defaults, 0 = Custom**".
    By using Left/Right buttons, select the "**X = Group Code**" from the menu and press the **ENTER** button.

13. The display will show "**X=GROUP CODE**". (Refer to 5.4-8 for group code)
    By using the Up/Down buttons, enter the "Group Code (?)" then by using Left/Right buttons, select the "**Curve**" from the menu.

14. The display will show "**X=CURVE**". (Refer to 5.4-8 for curve code)
    By using the Up/Down buttons, enter the "Curve Code (?)" followed by pressing the **ESCAPE** button.

15. The display will show "**Machine Defaults**".
    By using Left/Right buttons, select the "Tilt Setups" from the menu and press the **ENTER** button.

16. The display will show "**Tilt Setups: Calibrate Level**".
    Select the "**Tilt Setups: Calibrate Level**" from the menu and press the **ENTER** button.

17. The display will show "**Calibrate Level: Yes: Enter, No: ESC**".
    Select the "Yes" from the menu by press the **ENTER** button.

18. The display will show "**Calibrate Level: Tilt 0.0' , 0.0'**".
    Select the "**ESCAPE**" from the menu once.

19. The display will show "**Tilt Setups Calibrate Level**".
    Select the "**ESCAPE**" from the menu once again.

20. The display will show "**Setups Tilt Setups**".
    By using Left/Right buttons, select the "Load Setups" from the menu and press the **ENTER** button.

21. The display will show "**Load Setups: Calibrate Load**".
    Select the "**Load Setups: Calibrate Load**" from the menu and press the **ENTER** button.

22. At this point, elevate the aerial platform at full height, check the harness and making sure it is not stretched tight, then lower down the platform.

23. The display will show "**Calibrate Load: Platform Down?**".
    Asking for confirmation that the platform is fully lowered?
    Check that the platform is fully lowered then press the **ENTER** button to confirm.

24. The display will show "**Calibrate: Loaded Empty? No**".
    Asking for confirmation that the platform is empty?
    Check that the platform is empty

25. By using the Up/Down buttons, enter the "Yes" followed by pressing the **ENTER** button.

26. The display will show "**Calibrate Load: Please Lift.....**".
    Waiting for the lift switch to be activated.

27. Hold the lift switch and keep holding it until the platform is fully elevated.

IMPORTANT

If the lift switch is released earlier than full-height position, the calibration will have to be aborted and repeated from the beginning!

28. When the system detects the lift switch closed, the display will show "**Calibrate Load: Lift Empty**".

29. After a delay, the system will stop the platform lifting and will take height & pressure measurements; the display will show "**MEASURING # xx**" When the measurements have been taken, the platform will resume lifting.

NOTE

The Lifting.....stopping.....measuring....lifting process will continue until the platform reaches full height.

30. When the platform reaches full height release the lift switch.

31. The display will briefly show "**TOTAL DATA: 04**" to indicate the number of measurements taken.

32. The display will show "**Calibrate Load: Please Lower.....**".

IMPORTANT

If the lower switch is released earlier than full-lower position, the calibration will have to be aborted and repeated from the beginning!

33. Hold the lower switch and keep holding it until the platform is fully lowered.

34. When the system detects the lower switch closed, the display will show "**Calibrate Load: Lower Empty**"

35. After a delay, the system will stop the platform lowering and will take height & pressure measurements; the. display will show "**MEASURING #xx**". When the measurements have been taken, the platform will resume lowering.

NOTE

The lowering.....stopping.....measuring....lowering process will continue until the platform is fully lowered.

36. When the platform is fully lowered (and height 0% is displayed), release the lower switch.

37. The display will show briefly "**TOTAL DATA: 04**" to indicate the number of measurements taken.

38. The display will show "**Calibrate Load: Caldate: mm/dd/yy**".
    It is recommended that the current date be entered here to provide easy taking of the data of last calibration.
    The current date must be entered using the **LEFT**/**RIGHT** and **UP**/**DOWN** buttons.

39. Press ENTER to complete date entry (the system will store it).

40. The display will show "**Calibrate Load**" option.

41. Press the ESC button to exit the "**Calibrate Load**" option.

42. Remove the jumper wire and re-connect the black wire #14 to the coil removed earlier.

43. Close the hydraulic/electric tray.

NOTE

Continuing partially complete load calibration.

Once a calibration phase has been successfully completed, it is not required to do it again (unless of course a change to the vehicle such as a replacement sensor requires that calibration be repeated). This is useful if the calibration procedure is interrupted – the remaining phases can be completed at a later time.

If a calibration phase has been successfully completed, a "**REDO**" message is displayed:
REDO DYNAMIC: NO
REDO LOADED: NO
REDO EMPTY: NO

If the phase does not need to be repeated, just press **ENTER** to move on.
If the phase does need to be repeated, press **UP** or **DOWN** to change "**NO**" to "**YES**" then press **ENTER**.

5.4-8 Curve/Group Codes Chart

Model	Number of Extension Decks	Curve Code	Group Code
7027/7127	1 Manual Extension Deck	24	7
7027/7127	1 Powered Extension Deck	25	7
7135	1 Manual Extension Deck	26	7
7135	1 Powered Extension Deck	27	7
8831	No Extension Deck	30	9
8831	1 Manual Extension Deck	31	9
8831	1 Powered Extension Deck	32	9
8831	2 Manual Extension Decks	33	9
8831	2 Powered Extension Decks	34	9
8841	No Extension Deck	40	10
8841	1 Manual Extension Deck	41	10
8841	1 Powered Extension Deck	42	10
8841	2 Manual Extension Decks	43	10
8841	2 Powered Extension Decks	44	10
9250	No Extension Deck	52	10
9250	1 Powered Extension Deck	53	10
9250	2 Powered Extension Decks	54	10
6832RT	1 Manual Extension Deck	56	15
6826RT	1 Manual Extension Deck	57	15
9241	2 Powered Extension Decks	58	15

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